



Sussex Community  
NHS Foundation Trust

# Diabetic neuropathy

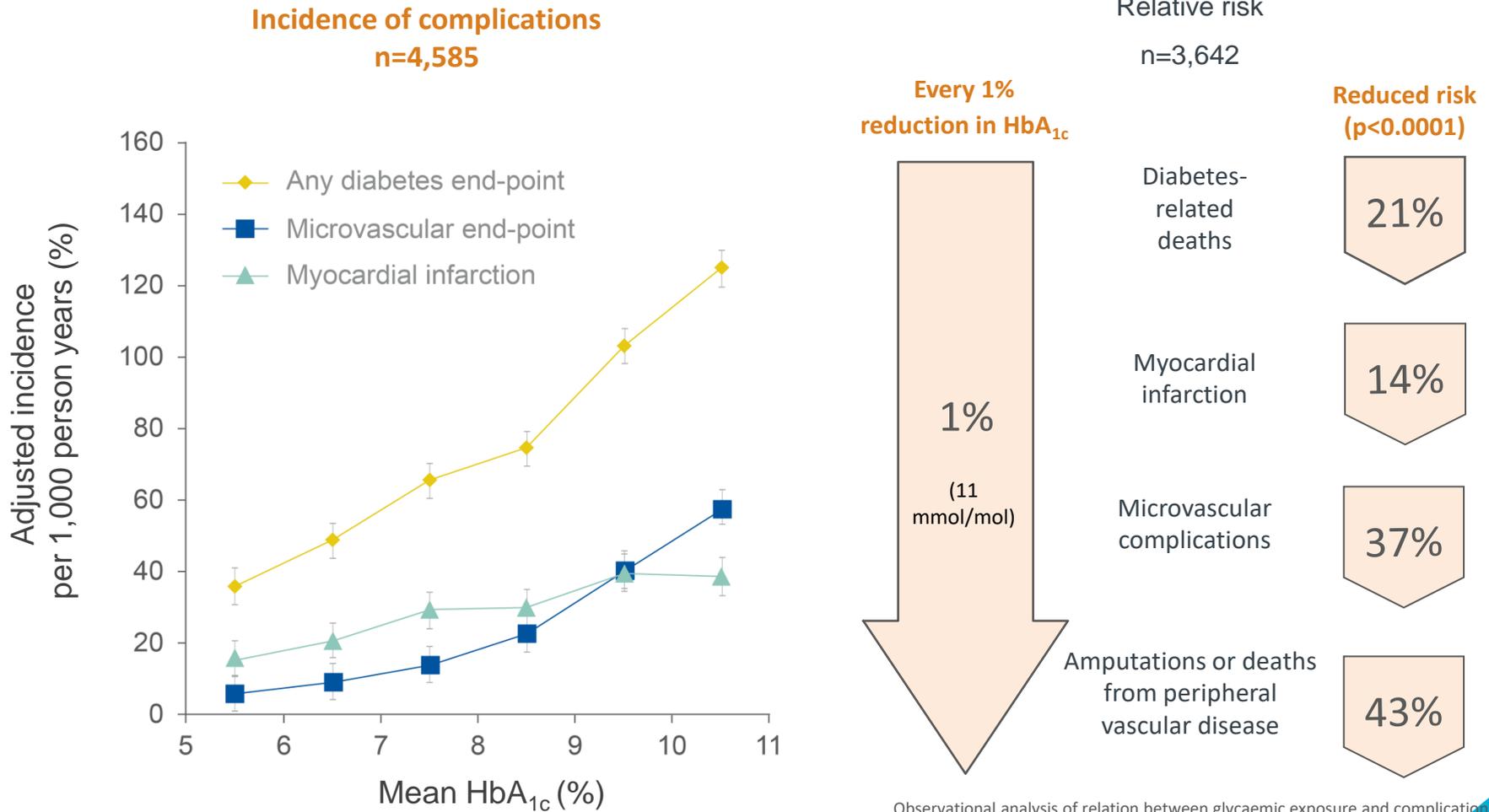
Jane Rowney

Consultant Diabetes Nurse



*Excellent care at the heart of the community*

# UKPDS: Improving HbA<sub>1c</sub> control reduces diabetes-related complications<sup>1</sup>



Adapted from Stratton IM et al.  
Data adjusted for age, sex, and ethnic group, expressed for white men aged 50–54 years at diagnosis and with mean duration of diabetes of 10 years.  
1. Stratton IM et al. *BMJ* 2000;321:405–412.

Observational analysis of relation between glycaemic exposure and complications of diabetes as estimated by decrease in risk for 1% reduction in HbA<sub>1c</sub>, measured at baseline and as updated mean. Data adjusted for age at diagnosis of diabetes, sex, ethnic group, smoking, presence of albuminuria, systolic blood pressure, high and low density lipoprotein cholesterol, and triglycerides.

# Definition

- Diabetic neuropathies are a family of nerve disorders caused by diabetes. People with diabetes can, over time, develop nerve damage throughout the body.

# Diabetic neuropathy may be categorised as follows

- [Sensory neuropathy](#) occurs when nerves which detect touch and temperature are damaged. This form of neuropathy commonly affects the feet and hands.
- [Motor neuropathy](#) results from damage to the nerves affecting muscle movement.
- [Autonomic neuropathy](#) follows if the nerves which control involuntary actions, such as digestion or heart rate are affected.

# Causes

- metabolic factors, such as high blood glucose, long duration of diabetes, abnormal blood fat levels, and possibly low levels of insulin
- neurovascular factors, leading to damage to the blood vessels that carry oxygen and nutrients to nerves
- autoimmune factors that cause inflammation in nerves
- mechanical injury to nerves, such as carpal tunnel syndrome
- inherited traits that increase susceptibility to nerve disease
- lifestyle factors, such as smoking or alcohol use

# Symptoms of nerve damage may include

- numbness, tingling, or pain in the toes, feet, legs, hands, arms, and fingers
- wasting of the muscles of the feet or hands
- indigestion, nausea, or vomiting
- diarrhoea or constipation
- dizziness or faintness due to a drop in blood pressure after standing or sitting up
- problems with urination
- erectile dysfunction in men or vaginal dryness in women
- weakness

# Peripheral neuropathy affects

- toes
- feet
- legs
- hands
- arms

# Autonomic neuropathy affects

- heart and blood vessels
- digestive system
- urinary tract
- sex organs
- sweat glands
- eyes
- lungs

# Proximal neuropathy affects

- thighs
- hips
- buttocks
- legs

# Focal neuropathy affects

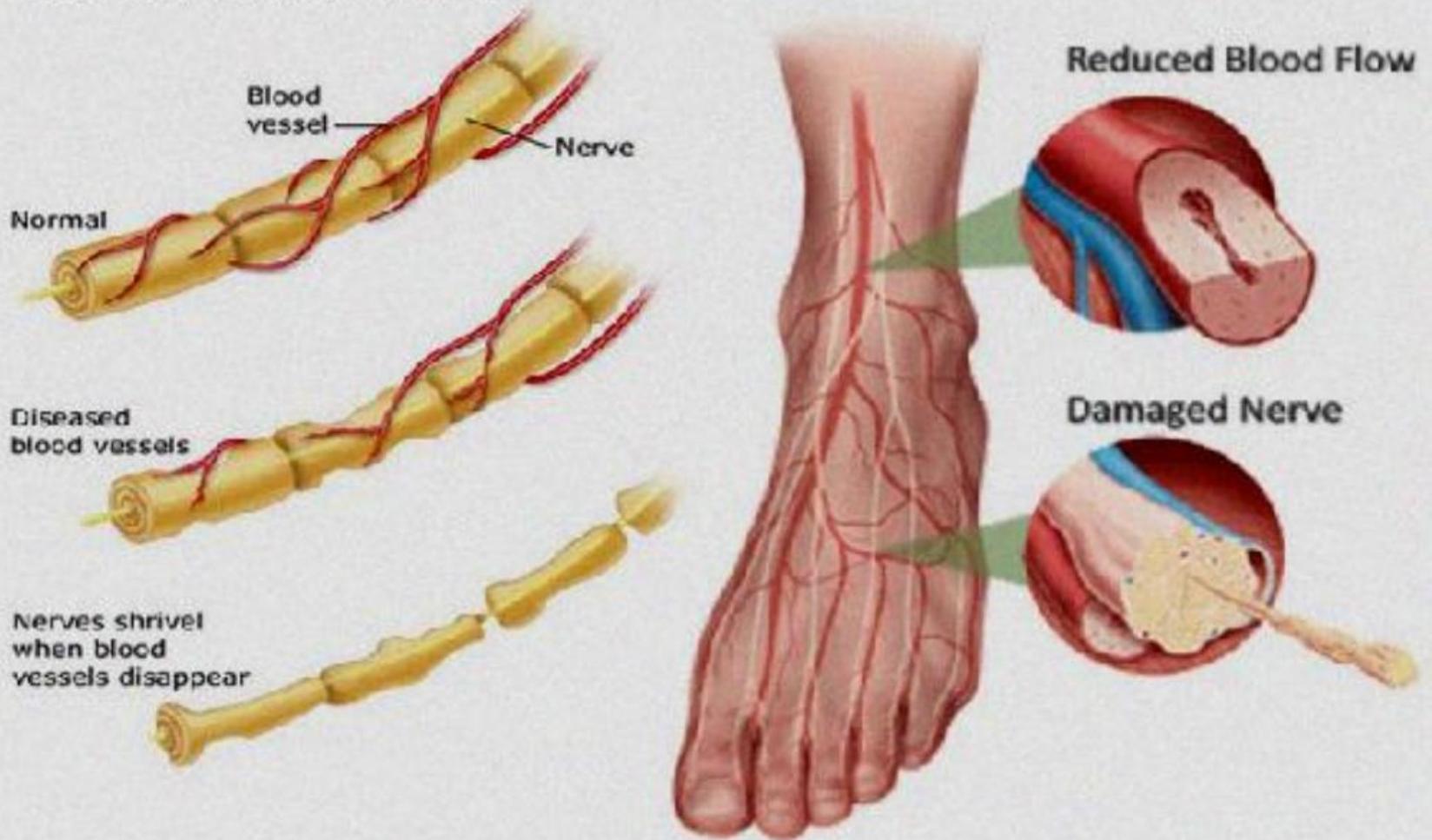
- eyes
- facial muscles
- ears
- pelvis and lower back
- chest
- abdomen
- thighs
- legs
- feet

# Painful Peripheral neuropathy



# Diabetic Neuropathy

Diabetes Affects the Nerves



# Diagnosis

- Gradual onset of numbness, prickling or tingling in your feet or hands, which can spread upward into your legs and arms.
- Sharp, jabbing, throbbing, freezing or burning pain.
- Extreme sensitivity to touch.
- Lack of coordination and falling.

# Treatment before drugs

- Exercise
- Management of glucose control
- Massage therapy.
- Vitamin supplements.
- Clothing
- Stop smoking
- Reduce alcohol
- Diet

# Drugs

- Capsaicin cream
- Tricyclic antidepressant
- Antiepileptic drugs
- Opioid analgesia

# Capsaicin cream

- Apply to skin 3-4 times a day sparingly on clear dry skin
- Do more frequently than 4 hrs
- avoid contact with eyes, avoid hot showers or bathe before or after application
- Review after 8 weeks

# Side effects

- Burning sensation
- Skin irritation
- Muscle spasm
- Pain
- Peripheral oedema

# Tricyclic antidepressant

## Amitriptyline

- Initial dose 10mgs once daily at night increase as necessary to a maximum of 75mgs

## Duloxetine

- 60mgs once daily
- Can increase to 60mgs BD (in exceptional cases)

# Side effects

## Amitriptyline

- Abdominal pain
- Fatigue
- Hypertension
- Dysarthria (speech)
- Agitation, anxiety

## Duloxetine

- Abdominal pain
- Abnormal dreams
- Anorexia
- Anxiety
- Constipation
- Decreased appetite
- Diarrhoea
- Dizziness
- Headache
- Palpitations

# Antiepileptic drugs

## Gabapentin

- Day 1 300mgs
- Day 2 300mgs BD
- Day 3 300mgs TDS
- Adjust according to effect to a maximum of 3.6g in divided doses per day

## Pregabalin

- 150mgs daily in 2-3 divided doses
- Increase after 3-5days
- Maximum dose 600mgs daily in divided doses

# Antiepileptic drugs – Side effects

## Gabapentin

- Abdominal pain
- Abnormal reflexes
- Abnormal thoughts
- Acne
- Amnesia/confusion
- Anorexia
- Anxiety
- Constipation/diarrhoea
- Fever/flu symptoms

## Pregabalin

- Appetite changes
- Blurred vision
- Confusion/drowsiness
- Constipation
- Disturbances in muscle control and movement
- Dizziness
- insomnia

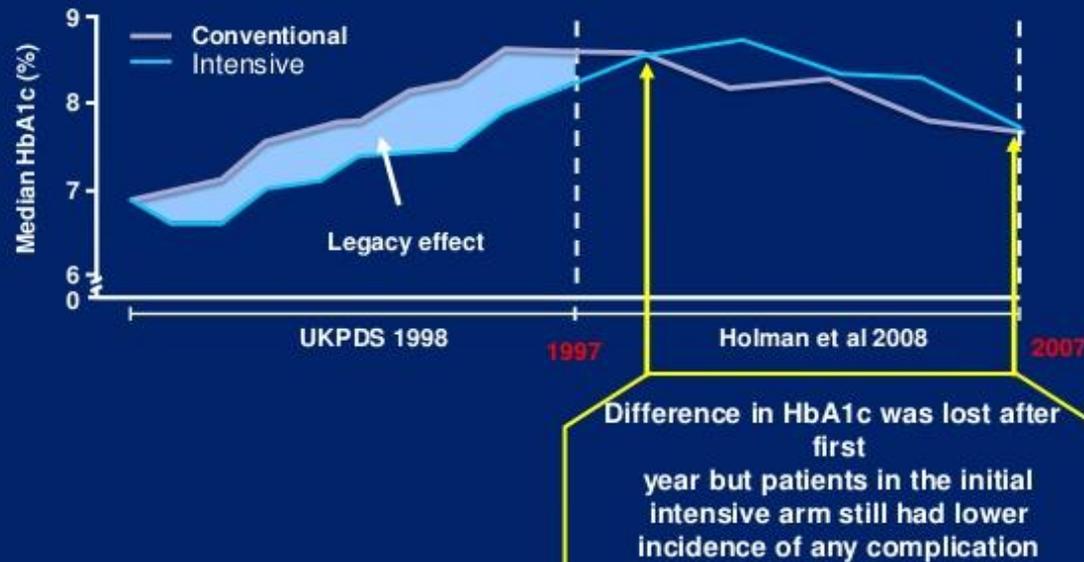
# Other medication

- Over the counter NSAIDs
- Opioids
- Referral to pain clinics

# Prevention

**UKPDS:** Achieving early glycaemic control may generate a good legacy effect

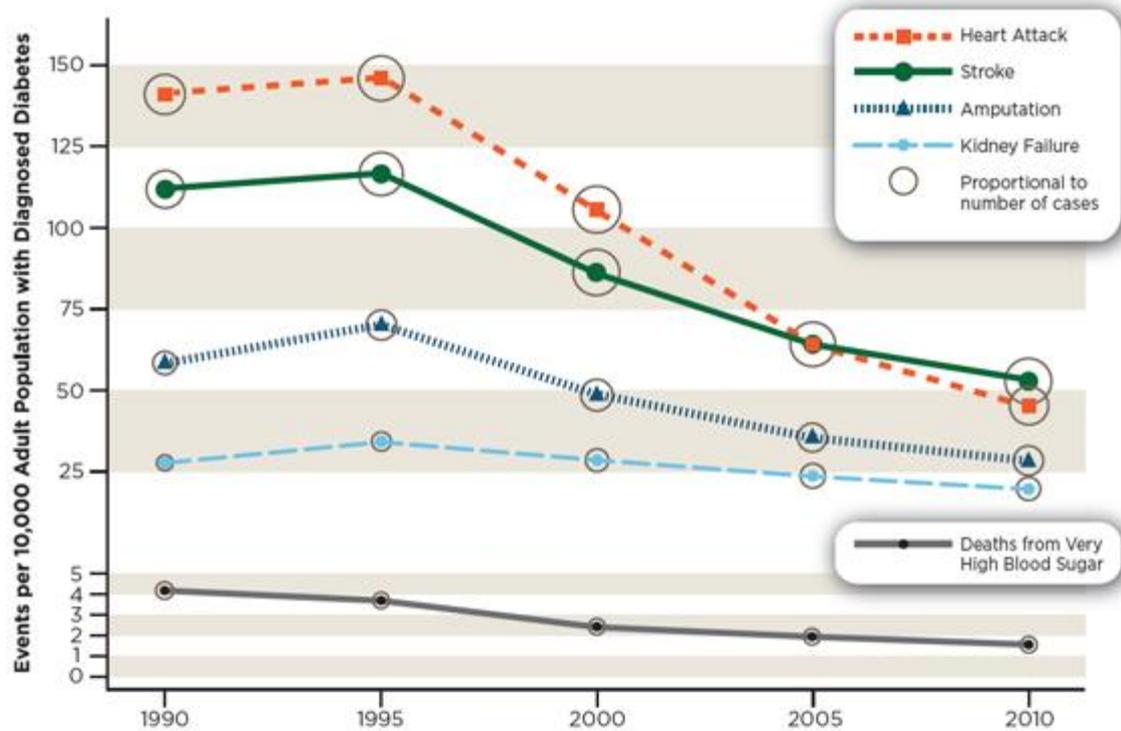
Patients initially received intensive therapy had a **lower incidence** of any complication



HbA1c=haemoglobin A1c.  
Diabetes Trials Unit. UKPDS Post Trial Monitoring. UKPDS 80 Slide Set. Available at: <http://www.dtu.ox.ac.uk/index.php?maindoc=ukpds/>. Accessed 12 September, 2008; Holman RR, et al. *N Engl J Med.* 2008; 359: 1577-1589; UKPDS 33. *Lancet.* 1998; 352:837-853.

- 
- Diagnostic tests in this field are evolving rapidly. These include the use of skin biopsies to measure small unmyelinated fibres, as well as even newer techniques that can measure both small unmyelinated fibres and large myelinated fibres in the same biopsy.
  - The main treatments for painful diabetic neuropathy remain management of the underlying diabetes and drugs for the relief of pain.
  - Enhanced glucose control is much more effective at preventing neuropathy in
  - Finally, neuropathic pain is under-recognized and undertreated despite an ever evolving list of effective drugs. E
  - Evidence exists to support several drugs, but the optimal sequence and combination of these drugs are still to be determined.
- 

**Trends in Rates of Diabetes-Related Complications from 1990 to 2010  
among U.S. Adults with Diagnosed Diabetes**



# What can patients do

- Maintain good glycaemic control
- Good foot care and daily checks
- Foot protection
- Activity
- Balanced diet
- Management of medication

# What can we do as health care professionals

- Medication reviews
- Early management of glycaemic control
- Education
- Annual reviews
- Report and treat
- Titration of medications