Care of older people with diabetes

DIABETES

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Abstract
The global population is ageing, and increasingly developing long-term conditions and comorbidities associated with functional changes, reduced quality of life and reduced life expectancy. Diabetes mellitus is a common long-term condition in older people, with many individuals experiencing microvascular and/or macrovascular complications, alongside frailty and dementia. Symptoms of conditions such as hypoglycaemia and hyperglycaemia may change as a result of older age and long duration of, and complications associated with, diabetes; therefore, such symptoms can be challenging to recognise in older people. Consequently, treatment might be delayed, which can result in further deterioration and harm for older people. Managing diabetes is often challenging for older people with the condition and their family carers and nurses. One of the main challenges for healthcare professionals is deciding safe blood glucose and glycated haemoglobin ranges for the individual to avoid over-treatment that can lead to hypoglycaemia or under-treatment that can lead to hyperglycaemia and associated adverse effects. This article outlines the issues that nurses should consider when caring for older people with diabetes, and emphasises the importance of personalised care.

Keywords diabetes, hyperglycaemia, hypoglycaemia, long-term conditions, older people, type 1 diabetes, type 2 diabetes

Aims and intended learning outcomes
This article aims to enhance nurses’ awareness of the complexity of caring for older people with diabetes mellitus and the importance of personalising care. After reading this article and completing the time out activities you should be able to:
» Outline the effects of diabetes and its associated complications for older people.
» List the strategies that can be used to personalise care for an older person with type 1 or type 2 diabetes.
» Describe the factors that lead to functional decline in older people with diabetes and strategies to identify and minimise the risks associated with functional decline.
» Discuss the risks associated with polypharmacy and the nurse’s role in medicines management for older people with diabetes.
» Understand the importance of considering palliative and end of life care for older people with diabetes and advanced complications.

Relevance to The Code
Nurses are encouraged to apply the four themes of The Code: Professional Standards of Practice and Behaviour for Nurses and Midwives to their professional practice (Nursing and Midwifery Council (NMC) 2015). The themes are: Prioritise people, Practise effectively, Preserve safety, and Promote professionalism and trust. This article relates to The Code in the following ways:
» The Code states that nurses must pay special attention to promoting
well-being, preventing ill health and meeting the changing health and care needs of people during all life stages. This article outlines how the effects of diabetes and associated complications may change as people age, and the subsequent changes in care that might be required for older people.

» It emphasises the importance of personalising care for older people with diabetes, and developing an individualised care plan with them. This is in accordance with The Code theme of prioritising people, which states that nurses must treat people as individuals and uphold their dignity.

» The Code states that nurses must work cooperatively and act in partnership with those receiving care. This article states that nurses should work with older people, their family carers and other healthcare professionals in providing care.

» It provides evidence-based information about care strategies that nurses can adopt when providing care for older people with diabetes. This is relevant to The Code theme of practising effectively.

Introduction
The global population is ageing and age-related changes in glucose homeostasis mean older people are at increased risk of diabetes (International Diabetes Federation (IDF) 2013). While most older people have type 2 diabetes, many people with type 1 diabetes can be diagnosed in older people (Turner et al 1997). Data from large epidemiological studies indicates that the incidence of type 1 diabetes is increasing by 2-5% per year worldwide (Maahs et al 2010). Significantly, 25% of people are diagnosed with type 1 diabetes in adulthood, in some cases when they are over the age of 90 years, and 10% of people initially diagnosed with type 2 diabetes have pancreatic autoantibodies consistent with type 1 diabetes (Thunander et al 2008). Consequently, insulin treatment, which is necessary for people with type 1 diabetes, can be delayed and affect their overall health, quality of life and life expectancy. Therefore, it is important for nurses and other healthcare professionals to identify the type of diabetes the older person presents with, to ensure they receive appropriate care and monitoring.

While several guidelines recommend care options for older people with diabetes, most focus on the condition itself, and rarely encompass inter-related comorbidities or address general healthcare issues that nurses commonly encounter with this patient group (Molokhia and Majeed 2017). In addition, evidence from high-quality research trials is often lacking or derived from subgroup analysis of data obtained from generally healthy older people with diabetes, who are taking few medicines, and therefore differ from many older people that nurses encounter in healthcare settings. Thus, guideline recommendations are generally based on consensus opinion and clinical experience derived using evidence-based principles.

The Diabetes Control and Complications Trial Research Group et al (1993) demonstrated the importance of maintaining blood glucose levels as close to the normal range as possible for younger people with type 1 diabetes, to prevent long-term microvascular complications. This has been supported by subsequent follow-up studies such as the Diabetes Control and Complications Trial/Epidemiology of Diabetes Interventions and Complications (Nathan and DCCT/EDIC Research Group 2014). Similarly, the UK Prospective Study (UKPDS) Group (1998) and randomised controlled studies (Action to Control Cardiovascular Risk in Diabetes Study Group et al 2008, ADVANCE Collaborative Group et al 2008, Duckworth et al 2009) provide evidence for the long-term benefits of achieving near-normal glycaemic control and managing other cardiovascular risk factors such as hypertension and hyperlipidaemia in people with type 2 diabetes. However, the UKPDS Group (1998) excluded people aged over 65 years in their study.

While the Action to Control Cardiovascular Risk in Diabetes Study Group et al (2008) included middle aged and older people and aimed to achieve a glycated...
haemoglobin (HbA1c) level of <6.0% in the intensive treatment group and a HbA1c of 7.0-7.9% in the standard treatment control group, this study was stopped early because of the risk of death in the intensive treatment group. Most participants who died were aged 65 years and over, taking more medicines and had more serious hypoglycaemic episodes than those in the standard treatment control group. There was no significant difference in the number of deaths from cardiovascular disease between the intensive treatment group and the standard treatment control group. These findings demonstrate the risks associated with aiming for near-normal HbA1c for many older people.

Another study using a UK database of patients aged over 50 years with type 2 diabetes indicated considerable risk of death at a HbA1c >7.5% (Currie et al 2010). Huang et al (2011) reported an increased risk of microvascular complications and cardiovascular events at a HbA1c <6.0%. These findings may be challenging for nurses and guideline developers to interpret and apply to clinical practice, because the relationship between HbA1c and mortality risk is unclear. Hypoglycaemia is associated with falls and related injuries, as well as cognitive and cardiac changes (Nelson et al 2007, Snell-Bergeon and Wadwa 2012, Dunning et al 2014). However, hypoglycaemia can also occur at a higher HbA1c in older people (Dhaliwal and Weinstock 2014). Similarly, older people with diabetes may die as a result of other causes such as infections, which may result from hyperglycaemia (Martin et al 2006).

Diabetes and older age

The term ‘older people’ generally refers to those with a chronological age of 65 years and over (World Health Organization 2002). An individual’s old age and function are partly determined by genetics, and, to a large extent, their lifestyle behaviours when they were younger (Passarino et al 2016). For those with diabetes, the duration of their diabetes will also be a factor. Long duration of diabetes is often associated with sensory, physical, psychological and situational changes if blood glucose control is inadequate (Diabetes Control and Complications Trial Research Group et al 1993, UKPDS Group 1998, Action to Control Cardiovascular Risk in Diabetes Study Group et al 2008).

It is important to emphasise that chronological age is not an accurate indicator of functional ability or diabetes status; therefore, it is not an appropriate basis for planning care. Most older people with diabetes self-care and live in the community with or without various levels of support. This support is often provided by family members. Some older people require an increased level of support in the community or live in care homes; up to 27% of care home residents have diagnosed or undiagnosed diabetes (Institute of Diabetes for Older People 2014). Older people with undiagnosed diabetes are at risk of inadequate treatment that adversely affects their quality of life. Box 1 shows the IDF (2013) functional categories of older people with diabetes.

Ageing reduces the body’s capacity to regenerate pancreatic beta cells, resulting in decreased insulin secretion and impaired glucose tolerance. Genetic predisposition and lifestyle factors such as obesity and a lack of physical activity result in insulin resistance and loss of lean body mass (Passarino et al 2016). Insulin resistance and the resultant hyperglycaemia increases the risk of adverse inflammatory processes and sarcopenia (low muscle mass and low muscle function) (Cruz-Jentoff et al 2010), as well as frailty and its adverse effects, such as undernutrition and falls (Yang et al 2016, Kim et al 2017).

Obesity and ageing are associated with low-grade chronic inflammation and proinflammatory cytokines, including C-reactive protein, interleukin-6 and tumour necrosis factor-alpha, all of which affect insulin signalling, insulin resistance and the risk of type 2 diabetes (Kim et al 2017). Ageing is also associated with reduced mitochondrial functioning, which affects energy production within cells (Petersen et al 2004). Insulin signalling is an important aspect of
glucose homeostasis. It is initiated by insulin release that enables the uptake of glucose into fat and muscle cells and reduces glucose synthesis in the liver. Insulin signalling can be increased with regular physical activity, which supports the maintenance of blood glucose and lipid levels within an acceptable range and reduces the inflammatory process. However, hyperglycaemia is associated with microvascular, macrovascular and neuropathic complications that can impair the person’s ability to remain active and may lead to functional changes.

TIME OUT 1
Discuss with a colleague the reasons why it is important to personalise care plans for older people with diabetes. Give an example of a strategy you have used to engage an older person in developing a personalised diabetes care plan.

Management of diabetes in older people
The aim of nursing older people with diabetes should be to personalise care with the individual, to maximise their function and support them to remain positive and thrive in older age. Important strategies for nursing care include treating the older person as an individual, respecting the knowledge they have accumulated about their condition, preserving their autonomy as much as possible, and spending time with them. Box 2 outlines care strategies that nurses can adopt to support people with diabetes to thrive in older age.

There are several important issues relating to diabetes care that nurses should be aware of to provide effective care for older people with diabetes and to support their family carers. It is not within the remit of this article to discuss pharmacological treatments, such as glucose-lowering medicines used to manage complications associated with diabetes, because while the classes of medicines used are generally similar across countries, the brand names often differ. Nurses should be aware of the relevant formularies they can refer to for information about medicines, for example the British National Formulary (2017) in the UK.

TIME OUT 2
Reflect on which strategies you use in your practice and which could be introduced to improve the care of older people with diabetes. Consider how you could ensure healthcare professionals and family carers have the knowledge and competence to provide safe care to older people with type 1 and type 2 diabetes. You may wish to refer to guidelines from the IDF (2013), Dunning et al (2014) and the National Institute for Health and Care Excellence (NICE) (2017).

Glycaemic targets
There are many short-term and long-term risks associated with both high and low blood glucose levels. HbA1c is an effective indicator of long-term glycaemic control and is frequently used as an outcome indicator in research (Goldstein et al 2003). However, HbA1c results should be interpreted in the context of the individual’s health status; for example HbA1c can be lower in the presence of anaemia, recent blood loss and haemoglobinopathies (National Glycohemoglobin Standardization Program 2016). Experts have made different recommendations for HbA1c targets for older people with diabetes using the same evidence, ranging from 7.0-9.0% (IDF 2013, Mallery et al 2013, Dunning et al 2014, Inzucchi et al 2015), with many emphasising the importance of individualised targets for the older person.

BOX 1. Functional categories of older people with diabetes

- **Category 1:** functionally independent. Those who are living independently, have no significant impairments in activities of daily living, and are receiving no or minimal support
- **Category 2:** functionally dependent. Those who require some assistance with activities of daily living such as bathing, dressing or personal care. They may also require support to undertake diabetes self-care activities such as blood glucose monitoring, managing medicines and managing hypoglycaemia
  - Subcategory A: frail. Those who have a combination of significant fatigue, recent weight loss, severe restriction in mobility and strength, increased falls risk, and increased risk of institutionalisation
  - Subcategory B: dementia. Those who have a degree of cognitive impairment that has led to significant memory loss, disorientation or personality changes, and who are unable to self-care. Many of those in this subcategory will be relatively physically well
- **Category 3:** end of life care. Those who have a significant medical illness or malignancy and have a life expectancy reduced to less than one year. Individuals may require support to undertake self-care, require pain relief and are at risk of dehydration as a result of reduced thirst sensation. It may be necessary to make decisions about when to withdraw treatment and cease unnecessary and burdensome investigations. While specific diabetes care may not necessarily be the most important priority, it remains important to manage symptoms, provide comfort and improve the older person’s quality of life

(© International Diabetes Federation 2013)
Encompass restorative care and support autonomy. Restorative care approaches, which encourage the older person to consume a healthy diet and remain active to maintain quality of life and longevity. Early initiation of palliative care improves the older person’s function, increased risk of infection and increased risk of diabetic ketoacidosis in people with type 1 diabetes and a hyperglycaemic hyperosmolar state in people with type 2 diabetes (IDF 2013, Munshi et al 2013, Dunning et al 2014). Achieving a safe balance between hypoglycaemia and hyperglycaemia is important, but can be challenging because of the many factors that can affect glucose homeostasis.

**Box 2. Care strategies that nurses can use to support people with diabetes to thrive in older age**

Nurses should develop a care plan with the older person and/or their carers that is based on the best available evidence, and is safe and appropriate for the individual. Care strategies include:

> Respect the older person’s autonomy, wisdom and experience. Many older people are accustomed to self-managing their diabetes, including adjusting their insulin doses where necessary

> Assess the older person’s goals, values and preferences, health status and life expectancy before developing a care plan and at any change in the individual’s health status to ensure the care plan reflects this change

> Maximise the older person’s functional ability by emphasising what the individual can do to thrive. Older people require something to do, something to hope for, and social connections, as well as consideration of environmental factors, such as safe places to exercise, to preserve physical and mental health

> Encourage the older person to consume a healthy diet and remain active to maintain physical and mental health

> Assess the older person’s risk of hypoglycaemia and hyperglycaemia, and plan care to minimise this risk

> Encompass pharmacovigilance, which may include encouraging the use of non-pharmacological treatment options where possible, for example to manage pain. This also includes deprescribing (stopping unnecessary medicines) and undertaking regular medication reviews

> Adopt a proactive approach to managing expected age-related life transitions such as stopping driving, admission to hospital, entering a care home, and palliative and end of life care

> Engage family carers in discussions about the benefits and risks of treatment, where appropriate

> Advocate for, and implement, palliative care early to improve the older person’s outcomes and quality of life. Early initiation of palliative care improves the older person’s function, quality of life and longevity

> Encompass restorative care and support autonomy. Restorative care approaches, which focus on wellness rather than disability, are emerging as positive ways of supporting older people to improve their function, maintain independence and enhance quality of life (Australian Government Department of Health 2017)

> Refer or arrange referrals to appropriate colleagues such as GPs; diabetes educators; dietitians; podiatrists; and specialists in palliative care, pain and the care of older people, where indicated and appropriate

> Provide education for the older person and their family, adopting strategies tailored to the individual’s learning style, cognitive capacity and literacy level

(Adapted from Dunning et al 2014, Inzucchi et al 2015, NICE 2017). For example, the IDF (2013) recommends using different glycaemic targets for older people based on their functional category: a HbA1c of 7.0-7.5% for those in category 1; a HbA1c of 7.0-8.0% for those in category 2; a HbA1c of up to 8.5% for those in subcategories A and B; and avoiding symptomatic hyperglycaemia for those in category 3 (IDF 2013).

Generally, blood glucose ranges and HbA1c targets can be raised as the individual ages, since their function and capacity to undertake self-care may decrease, while their risk of hypoglycaemia increases. However, hyperglycaemia is also associated with adverse effects, such as reduced cognitive function, increased risk of infection and increased risk of diabetic ketoacidosis in people with type 1 diabetes and a hyperglycaemic hyperosmolar state in people with type 2 diabetes (IDF 2013, Munshi et al 2013, Dunning et al 2014). Achieving a safe balance between hypoglycaemia and hyperglycaemia is important, but can be challenging because of the many factors that can affect glucose homeostasis.

**TIME OUT 3**

Describe three strategies you could use to identify and manage a) mild hypoglycaemia in an older person and b) severe hypoglycaemia in an older person taking insulin. How would you determine whether:

» The strategies you used to identify hypoglycaemia were effective?

» The strategies you used to manage the hypoglycaemic episode were effective?

**Hypoglycaemia**

Hypoglycaemia generally refers to a blood glucose level below 4mmol/L (Diabetes UK 2017). A hypoglycaemic episode can be mild if the individual is able to self-treat and ingest glucose orally; or severe and life-threatening if the individual is unconscious, requires assistance to manage the episode and requires intravenous glucose because they are unable to ingest glucose orally (Anderson et al 2014).

Hypoglycaemia is common in older people and often missed because its symptoms may change as a result of increased age and long duration of diabetes. Symptoms of neuroglycopaenia (a lack of glucose in the brain), such as confusion and behaviour change, are more common in older people than the well-known adrenergic symptoms of sweating, palpitations and anxiety (Cryer 2007). The counterregulatory hormone response to falling blood glucose levels – such as glucagon, which releases glucose stores when blood glucose is low – diminish with long duration of diabetes, and can be lost early in the course of type 1 diabetes (Siafarikas et al 2012).
These changes can make it challenging to recognise hypoglycaemia and may affect the individual’s ability to self-manage the episode. Therefore, it is necessary for each individual with diabetes to have a safe and personalised:

» Capillary blood glucose range.
» HbA1c range.
» Blood glucose testing regimen.
» Education programme regarding their diabetes self-management, including medicines management.
» Hypoglycaemia management plan.

Early recognition and treatment of hypoglycaemia are essential. Hypoglycaemia is also associated with falls risk and injuries, such as fractures and head injuries (Nelson et al 2007), and can affect driving safety, including electric wheelchairs and farm equipment. Hypothermia can occur during severe hypoglycaemic episodes in cold weather and may impede recovery.

The risk factors for hypoglycaemia are shown in Box 3; the presence of any one of these factors indicates the older person is at high risk of hypoglycaemia, and the more risk factors present, the greater the risk. People over the age of 80 years are at high risk of severe drug-related hypoglycaemia (Greco and Angileri 2004). Healthcare professionals can identify an individual’s risk of hypoglycaemia by discussing the factors listed in Box 3 with them, and/or their families if appropriate. Alternatively, tools such as the Hypoglycaemia Risk Assessment Tools in the McKellar guidelines (Dunning et al 2014) or the Edinburgh Hypoglycaemia Scale (Graveling et al 2013) can be used.

The older person’s care plan for hypoglycaemia should be based on their personalised risk of hypoglycaemia, and could include:

» Educating the individual and family carers about the atypical signs and symptoms of hypoglycaemia.
» Considering strategies to manage hypoglycaemic episodes.
» Ensuring in-date glucagon is available to treat severe hypoglycaemia.
» Undertaking medication reviews and avoiding medicines that contribute to hypoglycaemia or using such medicines in the lowest effective dose.
» Assessing renal function regularly.
» Considering the action profile of glucose-lowering medicines and planning meals, blood glucose monitoring frequency and activity to match the action profile.

**Hyperglycaemia**

Hyperglycaemia generally refers to a blood glucose level above 7mmol/L before a meal, or above 8.5mmol/L two hours after a meal is consumed (Diabetes UK 2017). Glucose is present in the urine, and symptoms of hyperglycaemia occur at around 10-15mmol/L, which is generally a safer upper level for many older people (IDF 2013, Dunning et al 2014). Long duration of hyperglycaemia is associated with long-term complications, such as microvascular and macrovascular complications and neuropathy. While these complications must be identified and managed to promote the older person’s quality of life, the focus on preventing long-term diabetes-related complications that is a feature of caring for younger people with diabetes may not be appropriate or safe for older people.

Hyperglycaemia affects executive cognitive functions in the short term. Hyperglycaemia is caused by infections

**BOX 3. Risk factors for hypoglycaemia**

» Older age
» Long duration of diabetes
» Insulin or sulphonylureas use
» Unplanned or additional physical activity
» Cognitive impairment or dementia. Hypoglycaemia can affect cognitive functions such as problem-solving and decision-making in the short term, as well as the ability to self-care
» Declining kidney function, which affects the excretion of medicines
» Liver changes that affect medicine metabolism
» Gastrointestinal changes that affect food and oral medicine absorption
» Undernutrition, delayed or missed meals, erratic eating and anorexia of ageing, which affect nutrition stores and contribute to sarcopenia and frailty
» Unexpected weight loss, which might be a result of cancer or thyroid disease or be a prognostic indicator for approaching death
» Alcohol use
» Top-up doses of insulin used to treat hyperglycaemic episodes
» Altered counterregulatory response to hypoglycaemia, caused by long duration of diabetes and pathophysiological changes related to diabetes and older age, which can result in atypical symptoms of hypoglycaemia
» Social isolation

(Adapted from Munshi et al 2013, Anderson et al 2014, Dunning et al 2014)
such as urinary tract infections, pneumonia, foot infections and meningitis; conversely, its presence increases the risk of these infections, especially in people aged 65 years and over with a HbA1c >8.5% (Rao Kondapally Seshasai et al 2011, McGovern et al 2016).

It is important to be aware that capillary blood glucose tests can be lower than the actual blood glucose detected in the laboratory; especially in the presence of dehydration, which often accompanies hyperglycaemia (Ashraf and Rea 2017). Therefore, the severity of the metabolic destabilisation, including delirium, can be missed if relying on capillary blood glucose testing alone. If hyperglycaemia in the individual is not managed effectively, incontinence, dehydration, delirium and electrolyte disturbance can result in diabetic ketoacidosis or a hyperglycaemic hyperosmolar state, requiring hospital admission and management with an intravenous insulin infusion. A comprehensive assessment of the individual is necessary to identify and treat the underlying cause of hyperglycaemia and prevent further episodes (Dhatariya and Vellanki 2017).

Delirium is a potential consequence of hyperglycaemia that is characterised by changes in attention, awareness and cognition, and is associated with adverse outcomes and increased mortality in older people. It occurs in one in five older people, 33% of older people who have surgery and 80% of older people in intensive care (Fick et al 2002). Intercurrent infections such as urinary tract infections and pneumonia, as well psychoactive medicines, are common risk factors for delirium in older people (Kuswardhani and Sugi 2017). Nurses can use the Confusion Assessment Method to identify delirium in older people (Wei et al 2008).

Correction or top-up insulin doses are often used to treat isolated episodes of hyperglycaemia in people in care homes; however, they should not be used (Cheung and Chipps 2010, American Geriatrics Society 2015 Beers Criteria Update Expert Panel 2015), because top-up insulin doses can lead to an adverse cycle of hypoglycaemia and rebound hyperglycaemia. However, older people using an insulin pump or basal bolus insulin may use correction doses with meals to cover the carbohydrate load or to manage intercurrent illnesses; this is often referred to as ‘sick days’ management’. Providing education for the older person and their family carers, collaboratively developing a personalised care plan for sick days’ management, as well as reviewing and adjusting medicine doses where indicated, are important nursing care strategies in the management of hyperglycaemia in older people.

**Macrovascular complications**

Cardiovascular disease is the leading cause of death in older people with diabetes; therefore, it is important to manage its associated risk factors, such as hypertension, hyperlipidaemia and renal disease. The target blood pressure for older people is usually <140/90mmHg, but may be 130/80mmHg if it can be achieved safely without causing postural hypotension and increasing the risk of falls (van Hateren et al 2010). A systolic blood pressure of <130mmHg and a diastolic blood pressure of <75mmHg may increase mortality risk (van Hateren et al 2010).

Weight loss might be beneficial for some older people to reduce the risk of cardiovascular disease, but may contribute to malnutrition, sarcopenia and frailty. Flicker et al (2010) found that older people who were overweight did not have a higher mortality risk than those who were normal weight. However, a healthy diet, reducing salt intake, remaining physically active and smoking cessation are important to reduce the risk of cardiovascular disease. Antihypertensive and lipid-lowering medicines, such as statins, are often required, and medicines such as angiotensin-converting-enzyme inhibitors can be prescribed to preserve renal function (Australian Medicines Handbook 2017, British National Formulary 2017).

**Microvascular complications**

Retinopathy, renal disease and neuropathy are common microvascular complications
among older people with diabetes. They may affect self-care, driving ability and independence, and increase falls risk. Microvascular disease is regarded as a predictor of falls in people with type 1 diabetes (Kirkman et al 2012). Other age-related eye diseases, such as macular degeneration, cataracts and glaucoma, also affect falls risk, self-care and consequently safety, and should be assessed regularly.

Vision impairment affects the type of written and online information likely to be useful to older people, so its design and literacy level should be appropriate for the individual. Similarly, hearing impairment can affect nurse-patient interactions and the safety of the older person with diabetes. Ensuring the person has their glasses and hearing aids during consultations and education sessions are important to achieve an effective nurse-patient relationship and develop an appropriate care plan.

Older people are susceptible to foot disease from microvascular complications and neuropathy. Significant infection can be present with few symptoms in people with neuropathy (Foster 2017). Nurses have an important role in inspecting the older person’s feet, protecting them from friction and pressure, and providing education on appropriate foot care. Nurses also have an important role in managing dialysis, and screening for dental caries and depression in people with renal disease (NICE 2017).

Sarcopenia, frailty, malnutrition and physical activity
Sarcopenia is more common in people who have diabetes than those who do not have diabetes (Jang 2016). Sarcopenia begins in early middle age and predisposes the individual to frailty. Frailty is the inability to manage internal and external stressors, and is not a single condition; it is a non-specific manifestation of an individual’s underlying physical, mental and psychosocial status, although malnutrition and weight loss are important components (Pérez-Zepeda et al 2016). Frailty is common in people aged 65 years and over, but its prevalence varies depending on the tool used to measure frailty (Pérez-Zepeda et al 2016). Frailty can be present in individuals who are overweight, and weight loss might exacerbate the person’s risk of undernutrition, falls and hypoglycaemia. Frailty and hypoglycaemia appear to be bidirectional (Abdelhafiz et al 2015). Various valid scales are available that can assist nurses to assess an individual’s frailty and plan their care, for example the Clinical Frailty Scale (Rockwood et al 2005).

Other consequences of malnutrition include reduced independence, swallowing difficulties and increased risk of hypoglycaemia, anaemia, and vitamin B12, C, or D deficiencies; therefore, the older person might require vitamin supplements. Nurses can refer the individual to a dietitian and/or a speech and language therapist for advice. Malnutrition predisposes the individual to intercurrent infections, hyperglycaemia and suboptimal oral health, which further exacerbate difficulties related to food intake and enjoyment, and medicine-related adverse events (Kim et al 2017). Significantly, malnutrition is associated with increased morbidity (Clegg et al 2013).

Advice regarding physical activity for an older person should consider their interests and functional status. Walking, swimming, dancing, tai chi and yoga can be beneficial for physical and mental health. Tai chi can improve balance and flexibility and reduce falls risk (Kuramoto 2006, Kim et al 2017).

Medicines management
Nurses have an important role in medicines management, which may include prescribing. Pharmacovigilance is essential to ensure that medicines are prescribed, administered and monitored appropriately. Insulin is a high-risk medicine and is a leading cause of adverse events and hospital admissions (Dunning and Sinclair 2014). Care of older people who are prescribed insulin includes assessing injection sites for hypertrophy and lipodystrophy, which affect insulin absorption, and confirming whether the injection technique used by the healthcare professional, the individual with diabetes and/or their family carer, is appropriate.

Polypharmacy is common in older people with diabetes because several medicines are
often required to manage blood glucose levels, hypertension, hyperlipidaemia and other associated complications and comorbidities (Molokhia and Majeed 2017). Age and diabetes-related physiological changes affect the uptake, distribution, metabolism and excretion of medicines, thus regular, comprehensive medication reviews are essential. Medication reviews should include asking the person about all medicines they are taking, including any self-prescribed or complementary medicines. These can interact with conventional medicines, and should be considered as part of the individual’s medicine regimen (Dunning and Sinclair 2014).

Nurses and other healthcare professionals should aim to stop unnecessary medicines (deprescribing) and avoid commencing medicines that are unlikely to have any benefit during the individual’s life expectancy, and avoid prescribing medicines that are contraindicated or should be used with care in older people (Gallagher et al 2008, American Geriatrics Society 2015 Beers Criteria Update Expert Panel 2015). They should also regularly monitor the older person’s renal status and their capacity to self-administer medicines.

While nurses’ roles may not encompass all of these medicine management activities, they can advocate for older people by discussing such issues with nurse prescribers, medical staff and pharmacists.

**Mental health, cognitive function and dementia**

Hypoglycaemia and hyperglycaemia can have short-term effects on the older person’s cognitive function. Therefore, nurses should plan patient education around times when the individual’s blood glucose is in a safe range. Type 2 diabetes is associated with dementia (Yaffe et al 2013), and older people with dementia often present with behavioural challenges and stress for themselves their family carers and healthcare professionals. People with dementia who are taking insulin might require a different dose and dose regimen to reduce the risk of hypoglycaemia, for example a low-dose basal insulin and an injection of rapid-acting insulin when the person eats. Consequently, it is important for nurses to adopt a flexible approach to medicines management and diet.

Blood glucose monitoring can also be challenging, but remains an important activity for people with dementia taking insulin and sulphonylureas because of the high risk of hypoglycaemia and challenges identifying hypoglycaemia in this patient group. Continuous glucose monitoring can be beneficial, in which a glucose sensor is inserted into the skin; however, this is expensive and the person might remove the glucose sensor.

Some medicines can also contribute to confusion and behaviour change. People with dementia are at increased risk of under-recognised and under-treated pain and depression. Risk factors for depression include a high HbA1c level, insomnia, pain, vascular disease, significant loss of function and/or independence, death of a loved one, social isolation, nutritional deficiency, alcohol use, and long duration of diabetes and challenges associated with the condition and its management (Blazer 2009). Significantly, older people are at increased risk of suicide (Ibrahim et al 2017). Several tools that can be used to screen for depression in older people are available at: www.dementia.unsw.edu.au

**General healthcare checks**

General healthcare checks should be incorporated into the care plans of older people with diabetes. General healthcare checks include: immunisation; health screenings such as mammograms, and bowel and prostate checks; oral health and hearing assessments; and assessing the older person’s functional status and its effect on their safety and capabilities, for example driving and undertaking self-care activities (Dunning 2016).

It is important to assess the older person’s quality of life regularly. While standardised, valid tools are available, in the author’s experience it is more useful to determine the top three to five things that make life meaningful for the individual and regularly ask about any changes in
these. Simple dichotomous scales could be developed and used to quantify any change, for example asking ‘Has your quality of life changed in the past few weeks? Yes / No’ and, if yes, ‘Please tell me about the changes’. However, these scales are not usually necessary in clinical care; instead, patient-generated quality of life tools are more likely to reflect issues relevant to the individual.

**TIME OUT 4**
Reflect on how you feel about discussing advanced complications associated with diabetes and their effects on life expectancy with older people with diabetes and their families. How might you prepare for such a discussion.

**Palliative and end of life care**
Palliative care can be implemented alongside the patient’s usual diabetes care to manage diabetes-related complications, or other diseases such as cancer, and may include surgery to improve symptoms. Palliative care can improve quality of life and often extends life expectancy (Worldwide Palliative Care Alliance and World Health Organization 2014), and can ease the transition to end of life care. Supporting individuals and their families to plan for the end of life is an important aspect of nursing care.

Nurses can recognise when care is becoming futile based on their experience, and using tools such as the Gold Standards Framework (Gold Standards Framework Centre in End of Life Care CIC 2011), although this framework does not include diabetes-specific mortality indicators. Undertaking early discussions about end of life care can enable patients and families to have time to think about and document their care preferences in an advance care plan and other relevant documents, such as power of attorney, living wills and refusal of treatment forms, depending on the culture and the legal system of the relevant country.

**Family carers**
Family carers provide a significant amount of unpaid care, and more than one third continue to provide intense care to others while experiencing health issues themselves (Family Caregiver Alliance 2006). The family carer’s health status often influences their decision to admit their loved one to a care home (Family Caregiver Alliance 2006). Langa et al (2002) found that family carers provide an average of 10.1 hours of care per week for older people (aged ≥70 years) who are taking oral glucose-lowering medicines, and an average of 14.4 hours of care per week for those who are taking insulin; in comparison, family carers provided an average of 6.1 hours per week of care for older people without diabetes.

Carers are at risk of stress-related illnesses such as intercurrent infections, cardiovascular events and mortality during their time providing care and in the weeks and months following bereavement of the person they cared for (Carey et al 2014). Ill health and depression experienced by the carer may also affect the well-being and quality of life of the person they care for (Litzelman et al 2016).

**TIME OUT 5**
Robert is a 70-year-old man who has been admitted to your ward. He lives alone, and has had type 2 diabetes for 15 years. Robert tests his blood glucose infrequently, and his HbA1c was 7.6% when it was last taken eight months ago. He has been prescribed 10mg glipizide two times per day, which is an antidiabetic medicine. Robert also has a history of arrhythmia. He is in hospital after surgery to repair a fractured neck of femur sustained when he fell going home from the shops. Robert is confused, groaning and restless.

» Note down what other information about Robert you would require to develop a nursing care plan with him.

» List three questions you would ask Robert to obtain the information necessary to plan his care.

» Who else might you ask if Robert was not able to answer your questions?

» What assessments would you undertake? Consider any physical, mental and social issues, as well as relevant risks and his cognitive function at the time of the assessment.

**Conclusion**
Older people with diabetes are at risk of significant adverse events as a result of age and diabetes-related changes. Nurses need to be able to identify whether the
older person has type 1 or type 2 diabetes to enable the delivery of appropriate care and patient education. A healthy diet, regular physical activity and often pharmacological treatment, such as glucose-lowering medicines, are necessary to manage diabetes and its complications. Consequently, care often becomes challenging as physical and mental function decline and put the individual at risk of adverse events and complications, such as hypoglycaemia and hyperglycaemia, frailty, falls, cognitive changes and depression.

It is essential that personalised care is planned with the individual and is based on their health status, goals, values, preferences, life expectancy and needs. General healthcare checks and proactive planning for life events such as stopping driving, moving to a care home, and palliative and end of life care, are essential aspects of the older person’s care plan. Nurses should be aware that every encounter they have with an older person who has diabetes is an opportunity to reassess their care needs and care plan.

**TIME OUT 6**
Nurses are encouraged to apply the four themes of The Code (NMC 2015a) to their professional practice. Consider how caring for older people with diabetes relates to the four themes of The Code.

**TIME OUT 7**
Now that you have completed the article, you might like to write a reflective account as part of your revalidation.

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**References**


Diabetes in older people
TEST YOUR KNOWLEDGE BY COMPLETING SELF-ASSESSMENT QUESTIONNAIRE 911

1. Which statement is true?
   a) Most older people with diabetes have type 1 diabetes
   b) The type of diabetes that an older person has is irrelevant to the care they should receive
   c) Diabetes guidelines always encompass inter-related comorbidities and address general healthcare issues that nurses commonly encounter with older people
   d) Chronological age is not an accurate indicator of an individual’s functional ability or diabetes status

2. An older person who is in functional category 2:
   a) Does not require specific diabetes care; instead, providing pain relief and comfort should be prioritised
   b) Has no significant impairments in activities of daily living, and receives no or minimal support
   c) Requires some assistance with activities of daily living and undertaking diabetes self-care activities
   d) Has a life expectancy of less than one year

3. Which of the following is an effect of ageing?
   a) Improved cognitive function
   b) Reduced mitochondrial functioning
   c) Reduced number of comorbidities
   d) Reduced risk of hypoglycaemia

4. Glycated haemoglobin (HbA1c):
   a) Target levels should always be lowered as an individual becomes older
   b) Is not an effective indicator of long-term glycaemic control
   c) Should be interpreted in the context of an individual’s health status
   d) Can be higher in the presence of anaemia

5. A microvascular complication associated with diabetes in older people is:
   a) Neuropathy
   b) Sarcopenia
   c) Cardiovascular disease
   d) Malnutrition

6. A risk factor for hypoglycaemia is:
   a) Insulin or sulphonylureas use
   b) Cognitive impairment
   c) Declining kidney function
   d) All of the above

7. Which symptom of hypoglycaemia is more common in older people?
   a) Confusion
   b) Sweating
   c) Palpitations
   d) Anxiety

8. Which of the following is not a cause of hyperglycaemia?
   a) Urinary tract infection
   b) Neuroglycopenia
   c) Pneumonia
   d) Meningitis

9. The use of correction or top-up insulin doses in care homes:
   a) Is recommended to treat isolated episodes of hyperglycaemia
   b) Is recommended to avoid an adverse cycle of hyperglycaemia and rebound hyperglycaemia
   c) Should be avoided in treating isolated episodes of hyperglycaemia
   d) Should be prescribed for all older people with diabetes

10. An older person with diabetes should have a safe, personalised:
    a) Capillary blood glucose range
    b) Blood glucose testing regimen
    c) Hypoglycaemia management plan
    d) All of the above

How to complete this assessment
This self-assessment questionnaire will help you to test your knowledge. It comprises ten multiple choice questions that are broadly linked to the article starting on page 50. There is one correct answer to each question.
- You can test your subject knowledge by attempting the questions before reading the article, and then go back over them to see if you would answer any differently.
- You might like to read the article before trying the questions. The correct answers will be published in Nursing Standard on 27 September.

Subscribers making use of their RCNi Portfolio can complete this and other questionnaires online and save the result automatically. Alternatively, you can cut out this page and add it to your professional portfolio. Don’t forget to record the amount of time taken to complete it.

You may want to write a reflective account based on what you have learned. Visit rcni.com/reflective-account

This self-assessment questionnaire was compiled by Alex Bainbridge

The answers to this questionnaire will be published on 27 September

Answers to SAQ 909 on reflective practice, which appeared in the 30 August issue, are:
1. a 2. b 3. d 4. c 5. b 6. a 7. c 8. d 9. d 10. a