education

ART OF MEDICINE

Sterile water at colonoscopy—money down the drain?

At a time of protracted economic difficulty, hospital trusts are focusing on cost saving measures—bed number losses, job cuts, and a restriction on finite resources. We therefore wonder whether the use of sterile water at colonoscopy is an unnecessary luxury.

Our NHS trust performed 2424 colonoscopies during 2010-11, each of which used sterile water to irrigate the colonoscope and clean the lens. Bottles of sterile water cost 53 pence per litre—enough for roughly five patients. We therefore used about 485 bottles that year for colonoscopy alone, at a cost of £257. This can be extrapolated to include the other endoscopic procedures that also use this resource.

Currently 513 Joint Advisory Group accredited units perform endoscopic procedures nationwide. If our unit is representative, switching to tap water for colonoscopies alone would save the NHS £131 841 a year, more if all endoscopic procedures were included.

The sterile water used is not deionised, so there are no concerns about damaging the colonoscopes. When we initially considered this change the main concern was the possible risk of infection. Two studies have looked at contamination in bottled sterile water and tap water. They both concluded that bacterial growth was rare in both types of water and did not increase clinical complications because most organisms were non-pathogenic.

Given the cost savings we could make, this leads us to ask—if it's good enough for people to drink, can't we use tap water when examining their colons?

Jennifer Smith, surgical registrar
Charles Cross, foundation year one doctor
Patrick Scott, consultant colorectal surgeon, Department of General Surgery, Royal Blackburn Hospital, Blackburn BB2 3HH, UK

We welcome contributions to this column via our online editorial office: https://mc.manuscriptcentral.com/bmj.

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PRACTICE UPDATES

NICE recommends new treatment options for type 2 diabetes

It is difficult to manage patients with type 2 diabetes when current treatment choices are not appropriate for your patient. Canagliflozin, dapagliflozin, and empagliflozin are selective sodium-glucose cotransporter 2 (SLT-2) inhibitors, which work as monotherapy by decreasing the reabsorption of glucose in the kidneys and promoting the excretion of excess glucose in the urine. NICE now recommends these drugs as alternatives to dipeptidyl peptidase-4 (DPP-4) inhibitors for adult patients who are unsuitable for treatment with metformin, sulfonylurea, or pioglitazone.

http://bit.ly/1WmkulJ http://bit.ly/22vgEqn

Antifungal drugs for children with scalp ringworm: Cochrane review update

Tinea capitis is a common contagious scalp infection that affects prepubertal children globally. Trichophyton and microsporum fungi cause most infections. Oral antifungal drugs are needed for treatment and to prevent spread. The choice of drug should be targeted on the type of fungus causing infection. Although terbinafine is unlicensed in the UK for children, a Cochrane review update recommends terbinafine for four weeks as first line treatment for trichophyton infections (doctors should start treatment pending mycology results). Eight weeks of oral griseofulvin remains the treatment of choice for microsporum infections.

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FAST FACT—ASSESSMENT OF FLUID STATUS

The clinical assessment of volume state has substantial interobserver variability. The diagnosis of hypovolaemia and hypervolaemia lacks both sensitivity and specificity. As such, reproducible objective markers should also be sought.

These include:

Weight, which is the most accurate guide to fluid loss or gain

Blood pressure, which typically rises in hypervolaemic states

Oxygen saturation and respiratory rate—in hypervolaemia, changes in respiratory physiology may suggest pulmonary oedema.

BMJ Learning For more information visit BMJ Learning http://bit.ly/1XA3wBd.

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Acute painful breast in a non-lactating woman

Jessamy Bagenal,[1] Janani Bodhinayake,[2] Kathryn E Williams[3]

WHAT YOU NEED TO KNOW

- Uncomplicated mastitis can be managed in the community
- Offer admission and urgent referral to a general surgeon to patients with abscess, sepsis, haemodynamic instability, or mastitis with immunocompromise
- Offer outpatient referral for a cancer appointment to those with suspected inflammatory breast cancer or those whose symptoms fail to resolve

A 50 year old woman describes a three day history of a painful right breast.

Periductal inflammation, or mastitis can evolve into breast abscess. This condition must be differentiated from inflammatory breast cancer, a rare type of breast cancer that mimics the signs and symptoms of mastitis (table 1).

Smoking is the main predisposing factor for periductal mastitis due to ductal damage (relative risk from 6.2 to 26.4 for heavy smokers).[1-3] There is usually an infective element; commonly *Staphylococcus aureus*, enterococci, or *Bacteroides*. Poor hygiene and lower socioeconomic status are associated with breast abscess.[4]

[1]BMJ Editorial, BMA House, London jbagenal@bmj.com
[2]University College London, London
[3]University Hospital of South Manchester NHS Foundation Trust, Manchester

This is part of a series of occasional articles on common problems in primary care. The *BMJ* welcomes contributions from GPs.

Table 1 | Differentiation of inflammatory breast cancer from mastitis or breast abscess

Inflammatory breast cancer	Mastitis or breast abscess
Rare (1-6% of breast cancers)	Common
Rapidly enlarging breast globally	Breast doesn't usually enlarge
Erythema of entire breast (pink-red)	Erythema affects a localised area within the breast
No fever or leucocytosis	Fever and leucocytosis often present
Generalised oedema or peau d'orange	Oedema or peau d'orange usually affects a well demarcated area within the breast
Axillary lymphadenopathy may be present, but there may be no breast lump	Axillary lymphadenopathy unlikely
Risk factors are age, family history, and immunocompromise	Risk factors are age, breast feeding, and smoking

CPD/CME
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What you should cover

History

Pain of mastitis typically starts over hours to days—typical symptoms are pain, redness, and fever.

- Unilateral, subareolar, or periductal distribution is typical of mastitis (see fig 1). Inquire about symptoms that may drive onwards referral by indicating that the patient is systemically unwell or unstable—such as tachycardia and pyrexia.
- Be alert to symptoms that might suggest an alternate diagnosis; for example, itching may suggest a dermatological cause.[5] Inquire about longstanding symptoms or weight loss that might suggest a malignant process.[6]
- Explore risk factors such as smoking. Patients with diabetes, rheumatoid arthritis, corticosteroid treatment, or HIV infection or other immunocompromise are thought to be at increased risk, although the vast majority of women presenting with periductal mastitis do not have these identifiable risk factors and the cause is unknown.
- Ask about local factors that may increase the risk of mastitis. Nipple piercing may damage subareolar ducts, resulting in mastitis. Skin conditions such as eczema may provide a route of entry for bacteria,[4] which more commonly leads to cellulitis rather than mastitis.
- Inquire about underlying breast abnormality such as cysts or previous episodes of mastitis or abscess.

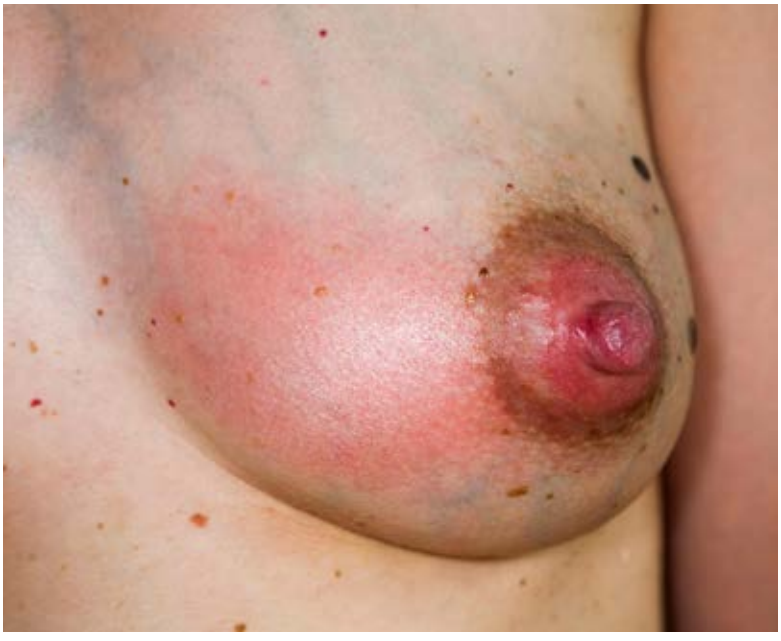

Fig 1 | Periductal mastitis

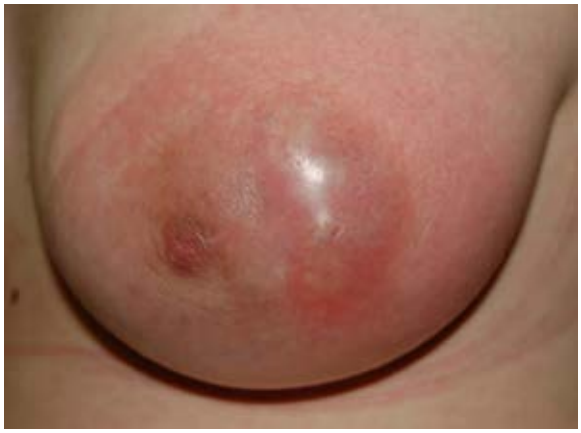

Fig 2 | Breast abscess (reproduced from Dixon J, Khan L. Treatment of breast infection. *BMJ* 2011;342:d396)

Examination

Examine both breasts, the axillae, and supraclavicular area.

- Ask the patient to raise her arms and compare the breasts. Note skin tethering, asymmetry, nipple inversion, oedema of the skin giving an "orange peel" appearance and dimpling, which may suggest breast cancer. Observe the distribution of erythema and any associated discharge or ulceration. Periductal mastitis will typically form a wedge shape (fig 1).[4]
- Palpate the breast. In mastitis, the overlying skin is usually warm. A focal, fluctuant swelling suggests an abscess (fig 2). Note any other breast masses or lymphadenopathy. Note their location, size, mobility, consistency, and relation to surrounding structures, including fixation to skin or muscle.
- Perform a basic set of observations such as pulse rate, blood pressure, and temperature to help gauge how systemically unwell the patient is.

Inflammatory breast cancer is rare but can be difficult to distinguish from mastitis (fig 3).[4 5]

What you should do

The management below is based on NICE guidelines,[5] which are extrapolated from WHO recommendations, expert opinion, and guidance about the more common scenario of lactational mastitis. Table 2 summarises the management options.

- Offer urgent referral to a breast or general surgeon to patients with
  - Suspected abscess
  - Sepsis
  - Haemodynamic instability
  - Immunocompromise.

  In these patients, basic blood tests may be offered as well as an ultrasound scan and mammogram. Ultrasound guided aspiration or mini-incision and drainage over the thinnest part of the abscess is best practice, and is normally performed through a breast department.
- Management of uncomplicated mastitis can begin in primary care. Offer analgesia and advise the patient to use a warm compress to alleviate tenderness. Prescribe an empirical antibiotic regimen such as oral co-amoxiclav for 10-14 days. For penicillin-allergic patients, a combination of clarithromycin or erythromycin with metronidazole is a reasonable choice.[1-8]
- Changes to the breast are worrying for patients, and it is important to be sensitive to this. Reassure patients that they can expect their breast to return to normal shape and size.[7]
- Arrange follow-up within two weeks to reassess and ensure resolution.
- If predisposing factors such as nipple piercing, skin conditions, or smoking are identified, offer advice on their management with a view to reducing the chance of recurrence.
- Advise patients to seek medical advice if symptoms worsen or are not resolving by 48 hours. At this point, consider an alternative diagnosis such as inflammatory breast cancer and Paget's disease and referral to secondary care. Consider referral for patients with any concerning features such as an underlying mass, mastitis that fails to resolve with a course of antibiotics, or weight loss for a suspected cancer appointment with a general surgeon or breast specialist.[9]

Table 2 | Summary of treatment of an acute painful breast[7]

Clinical features	Management
Haemodynamic compromise or systemic symptoms (fever, tachycardia, rigors) Rapidly progressing infection or immunocompromise	Arrange urgent hospital admission through on-call surgical services
Underlying mass or suspicion of breast cancer	Referral for urgent suspected cancer appointment within two weeks
Painful swollen fluctuant lump with overlying skin changes (abscess)	Urgent referral to surgeon or to breast services to arrange appointment within 24 hours
A tender, red, swollen, and hard area of the breast, usually in a wedge shaped distribution (mastitis)	Oral co-amoxiclav 500/125 mg three times a day (for penicillin-allergic patients, a combination of clarithromycin or erythromycin with metronidazole) for 10-14 days. Advise follow-up if symptoms don't resolve in 48 hours

HOW PATIENTS WERE INVOLVED IN THE CREATION OF THIS ARTICLE

No patients were involved in the creation of this article

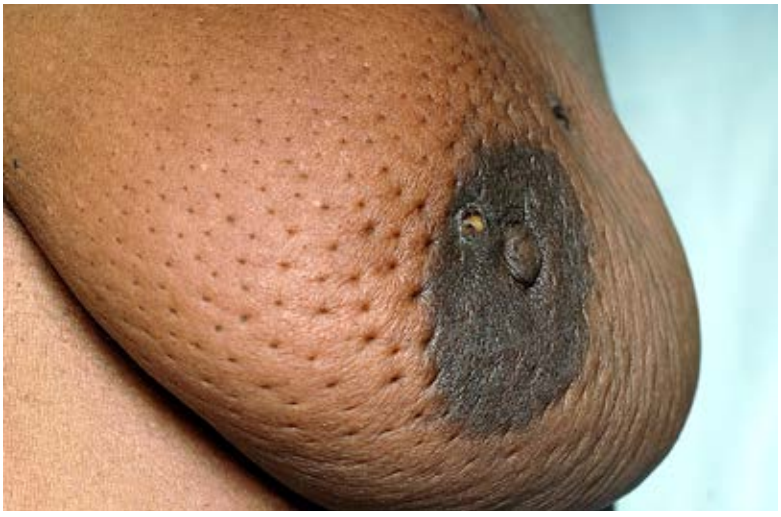

Fig 3 | Inflammatory breast cancer

EDUCATION INTO PRACTICE

Are women with breast problems taught breast self examination at your clinic?

Competing interests: None declared.

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WHAT YOUR PATIENT IS THINKING

Palliative care is not just for those who are dying

Ana Todorovic reflects on the things that helped her when facing the death of her unborn daughter Nadia

ROSE LLOYD

"There is no easy way to say this, but your baby is very, very sick." I was 37 weeks pregnant, and they had just found our baby had severe dilated cardiomyopathy. The doctor thought she would die within days. He suggested injecting potassium in her heart, to be certain that she would not survive terribly impaired.

She kicked and squirmed inside me as I tried to wrap my mind around this, stunned with shock. It made no sense to take action. Could we not simply let her die in peace? He said this was not an option. But later—perhaps because I asked—we found palliative care mentioned in the discharge note.

CPD/CME

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WHAT YOU NEED TO KNOW

- Remember to offer palliative care side by side with other options when death is imminent, even for newborns
- Precise statements in combination with a gentle tone work better than vague statements to cushion the blows surrounding death or illness
- When infants die, allow grieving parents to make sense of their child through affectionate contact during this short, precious time

Palliative care

And so at our next appointment we were greeted by two paediatricians who wanted to talk to us. They asked us what was going on. It felt natural to tell them our story. They listened intently, and I realised the purpose of this questioning much later: they wanted to get a sense of us first.

"What would you like to happen?"

I choked up in tears. I hadn't told anyone about my wish to meet her, to hold her while she was dying. They said my wish was common, and a knot of tightness in my chest unravelled.

"And what do you fear most?"

I was afraid how this would affect my relationship with my partner. He feared that our son might develop the same heart condition.

"What would you like to know?"

What she will look like when she's born, if she's not alive. I desperately needed to know all the details.

Precise information

One of the doctors echoed my words back to me before responding. Then he slowly, gently, answered. She would be swollen, especially her belly, but she'd otherwise look like any other infant. She might not breathe once the umbilical cord was cut. She might not survive the delivery. His words were precise, straightforward, no nonsense, and his approach soft, and this combination resonated with our need to know things, but at the same time to be sheltered from the blows of this knowledge.

Both doctors referred to our baby Nadia by name, showing us they knew how real she was to us.

The male doctor asked if I had considered having the birth induced earlier, to increase the chances of spending some time with Nadia. To have her birth induced while she was still alive. I really wanted that.

The other doctor said that parents experience this short time spent with their terminally ill infants as meaningful and important. She explained how Nadia would be fed and her pain relief administered. Precise words again. "Keeping her comfortable," the most common sentence we encountered when inquiring about palliative care, was too vague for me.

Allowing grief

The doctors were at ease with our tears. In the space of a couple of hours they had transformed what we were going through from something dreadful to something potentially meaningful.

Nadia died a week later, minutes before she was born. But I was braced for it, and I spent the time after delivery holding her while she was still warm. I got to know my daughter as much as anyone could have known her, and this meant the world to me.

Competing interests: None declared.

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For series information contact Rosamund Snow, patient editor, rsnow@bmj.com

Management of diabetes mellitus in older people with comorbidities

Elbert S Huang

Department of Medicine, University of Chicago, 5841 S Maryland Ave, Chicago, IL 60637, USA
ehuang@medicine.bsd.uchicago.edu

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WHAT YOU NEED TO KNOW

- Nearly 60% of older adults with diabetes have at least one comorbid condition
- Hospital admission rates for hypoglycaemia now exceed those for hyperglycaemia among older adults
- Taking medicines, following dietary and exercise advice and monitoring glucose concentrations while managing other co morbidities can be overwhelming
- Individualise the intensity of glucose control according to prognosis and patient preference
- Consider specialised care management programs for older patients not achieving their personal goals and those who may be over treated

Introduction

The age at which someone is identified as "older" has evolved with advances in medicine, but it is currently set at 65 years for most developed countries. The prevalence of diabetes is high; more than 20% of adults aged over 65 have a diagnosis of diabetes.[1] The management of the disease has been controversial; recurring debates have taken place about the appropriate intensity of glucose control and the role of glucose lowering medicines in this population.

Prevalence and pathophysiology

The prevalence of diabetes increases sharply with age,[10] affecting 21.8% of those aged 65-74 years.[1] The vast majority of older adults with diabetes have type 2 diabetes (96%).

Diabetes and comorbid conditions

Nearly 60% of older adults with diabetes have at least one comorbid chronic disease,[18-20] and as many as 40% have four or more comorbid diseases.[21]

Evidence about glucose control in older people

Randomized controlled trials

The landmark United Kingdom Prospective Diabetes Study (UKPDS) excluded people over the age of 65.[39 40] Subsequent major clinical trials, such as ACCORD (Action to Control Cardiovascular Risk in Diabetes), ADVANCE (Action in Diabetes and Vascular Disease: Preterax and Diamicron MR Controlled Evaluation), and VADT (Veterans Affairs Diabetes Trial), included adults over 65 years of age but did not include many participants over 75 years of age at the time of enrollment. The trials have heterogeneous results that may be due to differences in patient populations, available treatments, treatment protocols, and glycemic targets (table 1).

The UKPDS provides some of the most important observations regarding the variable timing and heterogeneous effects of intensive glucose control (glycated hemoglobin (HbA_{1c}) of 7.9% *v* 7.0%) in middle aged patients with recent onset of diabetes. During the original observation period of 10 years, intensive glucose control significantly lowered rates of microvascular disease (risk reduction 25%; P=0.001); however, the Kaplan-Meier plots separated significantly only after nine years of follow-up.[46 47] During the post-trial follow-up of an additional 10 years, the benefits of intensive glycemic control on microvascular complications persisted, and benefits for reducing mortality and myocardial infarctions emerged.[40] These findings have been called the legacy effect or metabolic memory and suggest that the effects of hyperglycemia on diabetes outcomes may differ according to the history of HbA_{1c} control.

JIM VARNEY/SPL

SUMMARY

Diabetes mellitus affects more than 20% of people over 65. In older patients with diabetes, comorbidities are highly prevalent and their presence may alter the relative importance, effectiveness, and safety of treatments for diabetes. Randomized controlled trials have shown that intensive glucose control produces microvascular and cardiovascular benefits but typically after extended treatment periods (five to nine years) and with exposure to short term risks such as mortality (in one trial) and hypoglycemia. Guidelines recommend that physicians individualize the intensity of glucose control and treatments on the basis of the prognosis and preferences of individual patients.

In the ACCORD trial, 10 251 participants with type 2 diabetes were randomly assigned to intensive glucose therapy (HbA_{1c}<6.0%) or standard therapy (HbA_{1c} 7.0-7.9%).[41] Compared with UKPDS, patients were older, had longer duration of diabetes (median duration 10 years), and had a high risk of cardiovascular disease. On average, the intensive therapy group achieved an HbA_{1c} of 6.4% and the standard therapy group achieved an HbA_{1c} of 7.5%. The trial was ended early after a mean follow-up of 3.5 years, because the intensive therapy group had a higher mortality rate than the standard therapy group (hazard ratio 1.22, 95% confidence interval 1.01 to 1.46). At five years' follow-up, the ACCORD trial re-confirmed a higher mortality rate in the intensive glucose therapy group (hazard ratio 1.19, 1.03 to 1.38) and a lower rate of non-fatal myocardial infarction (0.82, 0.70 to 0.96).[48] In age stratified analyses, ACCORD investigators have found that the excess mortality associated with intensive therapy occurred primarily in patients under 65 years of age.[49]

The ADVANCE trial included 11 140 participants with type 2 diabetes aged 55 years or older and randomized them to intensive glucose therapy (HbA_{1c}<6.5%) or standard glucose therapy.[42] Like ACCORD, ADVANCE enrolled patients at high risk for cardiovascular events and patients had an established history of diabetes (mean duration eight years). The intensive therapy and standard therapy groups in ADVANCE achieved HbA_{1c} levels of 6.5% and 7.3%, respectively, at five years' follow-up. However, unlike in the ACCORD trial, the intensive glucose therapy group had a 10% relative reduction in the combined outcome of major macrovascular and microvascular events (hazard ratio 0.90, 0.82 to 0.98), mostly due to a 21% relative reduction in nephropathy (0.79, 0.66 to 0.93), and no significant effects on major macrovascular events or death were seen. During six years of post-trial follow-up, there continued to be no significant effects on major macrovascular events or death.[43]

The VADT randomized 1791 veterans to intensive glucose therapy (an absolute reduction of 1.5% in HbA_{1c}) versus standard therapy.[44] Patients had a mean duration of diabetes of 11.5 years, and 40% had a history of cardiovascular disease. The intensive therapy group achieved a mean HbA_{1c} of 6.9%, and the standard therapy group achieved a mean of 8.4%. At a median of 5.6 years' follow-up, the primary outcome of major cardiovascular events was non-significantly lower in the intensive therapy group (hazard ratio 0.88, 0.74 to 1.05). No significant differences in death were seen between the two groups.[44] In an erratum, VADT investigators reported that progression of albuminuria was lower in the intervention therapy group than the standard therapy group.[50] In post-trial follow-up (total of 10 years' observation), the intensive therapy arm had a significantly lower risk of major

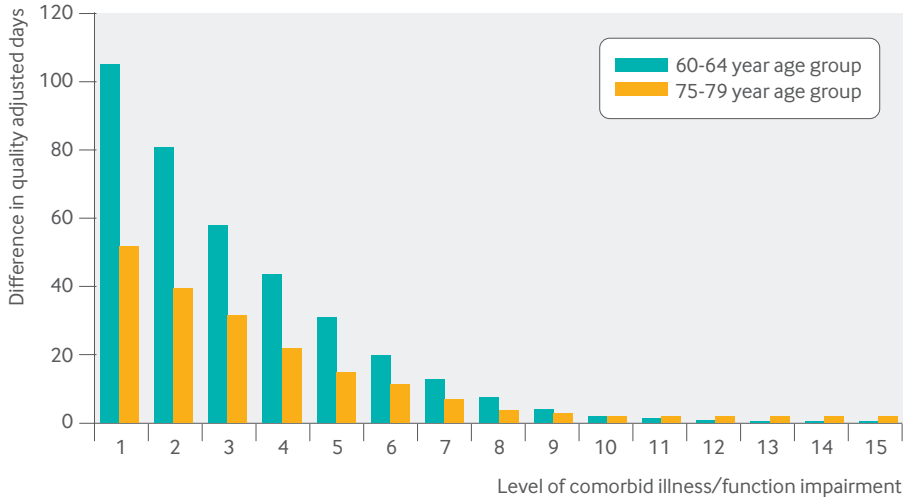


Fig 1 | Expected quality of life benefits of intensive glucose control for 60-64 year old and 75-79 year old patients with newly diagnosed diabetes, with increasing levels of comorbid illness and functional impairment[58]

Table 1 | Major randomized controlled trials of intensive glucose control

Characteristic	UKPDS[39 40]	ACCORD[41]	ADVANCE[42 43]	VADT[44 45]
Mean age, years	53.3	62.2	66	60.4
Duration of diabetes, years	Newly diagnosed	10 (median)	8 (mean)	11.5 (mean)
Achieved HbA_{1c} (intensive *v* standard)	7.9% *v* 7.0%	7.5% *v* 6.4%	7.3% *v* 6.5%	8.4% *v* 6.9%
Trial follow-up time, years	10	3.5	5	5
Within trial findings	Mortality: RR 0.94 (95% CI 0.80 to 1.10)	Mortality: HR 1.22 (95% CI 1.01 to 1.46)	Mortality: HR 0.93 (95% CI 0.83 to 1.06)	Mortality: HR 1.07 (95% CI 0.81 to 1.42)
	Microvascular complications: RR 0.75 (0.60 to 0.93)	Primary outcome (non-fatal and fatal cardiovascular disease): HR 0.90 (0.78 to 1.04)	Microvascular complications: HR 0.86 (0.77 to 0.97)	Cardiovascular events: HR 0.88 (0.74 to 1.05)
	Myocardial infarction: RR 0.84 (0.71 to 1.00)	Non-fatal myocardial infarction: HR 0.76 (0.62 to 0.92)	Macrovascular complications: HR 0.94 (0.84 to 1.06)	
Post-trial follow-up time	10 years	0.2 years of additional intervention period; 1.2 years	6 years	5 years
Post-trial follow-up findings	Mortality: RR 0.87 (0.79 to 0.96)	Mortality: HR 1.19 (1.03 to 1.38)	Mortality: HR 1.00 (0.92 to 1.08))	Mortality: HR 1.05 (0.89 to 1.25)
	Microvascular complications: RR 0.76 (0.64 to 0.89)	Primary outcome (non-fatal and fatal cardiovascular disease): HR 0.91 (0.81 to 1.03)	Microvascular complications: HR 0.92 (0.80 to 1.05)	Cardiovascular events: HR 0.83 (0.70 to 0.99)
	Myocardial infarction: RR 0.85 (0.74 to 0.97)	Non-fatal myocardial infarction: HR 0.82 (0.70 to 0.96)	Macrovascular complications: HR 1.00 (0.92 to 1.08)	

HR=hazard ratio; RR=relative risk.

Evidence suggests that recommendations to individualize care have not been adopted in clinical practice

cardiovascular events (hazard ratio 0.83, 0.70 to 0.99) but had no mortality benefit.[45]

Simulated trials

Because of the strict exclusion criteria of controlled trials, investigators have used microsimulation models and observational methods to gain more insight into the expected effect of intensive glucose control in the oldest and sickest patients.[53] One such microsimulation model evaluated how comorbidities and functional impairment would affect the potential benefits of intensive glucose control achieved in UKPDS (HbA_{1c} level of 7.0% v 7.9%).[58] For this analysis, the UKPDS outcomes model was revised by replacing the background mortality module with a previously developed geriatric mortality prediction model. The revised diabetes model showed that the expected benefits of intensive control were inversely related to the level of comorbid illness and functional impairment for a hypothetical population of adults 60-80 years of age.[35 54]

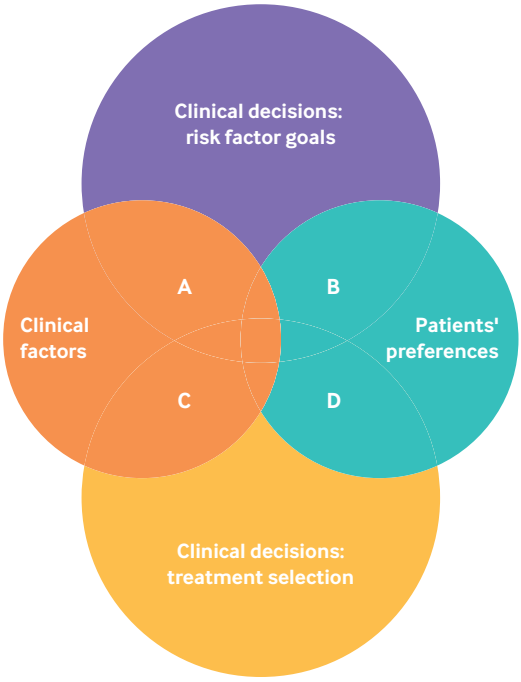
Hypoglycemia

Hypoglycemia has long been viewed as a barrier to achieving intensive glycemic control. In trials of intensive glucose control, rates of major hypoglycemia needing medical attention have always been consistently higher in the intensive control arms.[41-46] Although previously considered a secondary outcome, hypoglycemia has become a primary outcome of basic and clinical diabetes research.[63]

Several recent studies support the growing importance of hypoglycemia relative to traditional complications of diabetes. A natural history study of a contemporary cohort of older patients with diabetes assessed how the incidence and ranking of complications differed by age and duration of diabetes.[65] Among older adults with diabetes of short duration, cardiovascular complications followed by hypoglycemia were the most common non-fatal complications. Among patients aged 70-79 years with a short duration of diabetes, rates of coronary artery disease and hypoglycemia were higher (11.47 per 1000 person years and 5.03 per 1000 person years, respectively) than rates of end stage renal disease (2.60 per 1000 person years), lower limb amputation (1.28 per 1000 person years), and acute hyperglycemic events (0.82 per 1000 person years).

Hospital admission rates for hypoglycemia now exceed those for hyperglycemia among older adults.

Fig 2 | Conceptual model of personalised decision support[3]



Burden of everyday treatments

Related to hypoglycemia is the burden of everyday treatments, an underappreciated aspect of quality of life. The accumulation of tasks of taking medicines, following diets and exercise programs, and monitoring blood glucose concentrations, while also adhering to recommendations for other comorbid conditions, can be overwhelming.[27] Although this concept is important, it has been difficult to quantify with traditional measures of quality of life. One study used health state utility methods (a measure of preference) to ascertain the relative burden of diabetes related complications and treatments. It elicited utilities (ratings on a 0-1 scale, where 0 represents death and 1 represents perfect health) for

Table 2 | Comparison of clinical recommendations for HbA_{1c} goals in older patients with type 2 diabetes

American Geriatrics Society[68]		Department of Veterans Affairs[69]		American Diabetes Association[8]		European Diabetes Working Party for Older People[9]	
Description of patient stratum	HbA_{1c} goal	Description of patient stratum	HbA_{1c} goal	Description of patient stratum	HbA_{1c} goal	Description of patient stratum	HbA_{1c} goal
Healthy	7.0-7.5%	None or very mild microvascular complications; life expectancy of 10-15 years	<7.0%	Healthy (few coexisting chronic illnesses; intact cognitive and functional status)	<7.5%	Without major comorbidities	7.0-7.5%
Moderate comorbidities	7.5-8.0%	Long duration of diabetes (>10 years); requires combination drug regimen including insulin	<8.0%	Complex/intermediate (examples: multiple coexisting chronic illnesses*, ≥2 instrumental ADL impairments, or mild-moderate cognitive impairment)	<8.0%	Frail patients (dependent; multi-system disease; care home residency, including those with dementia)	7.6-8.5%
Multiple comorbidities	8.0-9.0%	Advanced microvascular complications and/or major comorbid illness; life expectancy <5 years	8.0-9.0%	Very complex/poor health (examples: long term care, end stage chronic illnesses†, moderate-severe cognitive impairment, or ≥2 ADL dependencies)	<8.5%‡		

ADL=activities of daily living.
*Conditions serious enough to require drugs or lifestyle management; may include arthritis, cancer, congestive heart failure, depression, emphysema, falls, hypertension, incontinence, stage 3 or worse chronic kidney disease, myocardial infarction, and stroke (multiple means ≥3, but many patients may have ≥5).
†Presence of single end stage chronic illness such as stages III-IV congestive heart failure or oxygen dependent lung disease, chronic kidney disease requiring dialysis, or uncontrolled metastatic cancer may cause considerable symptoms or impairment of functional status and significantly reduce life expectancy.
‡HbA_{1c} of 8.5% equates to estimated average glucose of ~200 mg/dL; less strict glycemic targets than this may expose patients to acute risks from glycosuria, dehydration, hyperglycemic hyperosmolar syndrome, and poor wound healing.

nine complication states and 10 treatment states in 701 patients with diabetes. End stage complications had lower mean utilities than intermediate complications (for example, blindness 0.38 (SD 0.35) *v* retinopathy 0.53 (0.36); P<0.01), and end stage complications had the lowest ratings among all health states. Intensive treatments had lower mean utilities than conventional treatments (for example, intensive glucose control 0.67 (0.34) *v* conventional glucose control 0.76 (0.31); P<0.01), and the lowest rated treatment state was comprehensive diabetes care (0.64 (0.34)). On average, patients rated comprehensive treatment states similarly to intermediate complication states. Importantly, patients' ratings of health states were highly heterogeneous, with some patients viewing comprehensive diabetes care as near perfect health whereas a significant minority (18%) viewed the same therapy as equivalent to death.

The perceived burden of treatments has important implications for determining the goals and treatments of diabetes in older patients. In cost effectiveness analyses, the incorporation of patients' preferences regarding life with treatments has shown that the value of intensive glucose control in older patients is highly sensitive to assumptions about quality of life with treatments.[66 67] This is because the effects of treatments on quality of life that are experienced routinely by all exposed patients can easily exceed the expected long term benefits of glycemic control that are experienced by a minority of patients.

Current state of care

Considerable evidence suggests that recommendations to individualize care have not been adopted in clinical practice. Multiple studies of care of older patients with diabetes in national datasets have shown that the intensity of treatments does not differ by health status.[64-73] One study described the intensity of diabetes treatment among older patients classified by health status in the National Health and Nutrition Examination Survey (NHANES) (2001-10).[74] The proportion of older patients achieving an HbA_{1c} below 7.0% was 61% overall and no different across the three tiers of health status. Among patients with HbA_{1c} below 7.0%, 54.9% were treated with either insulin or sulfonylureas, and this proportion was similar across the three tiers of health status.

Two main areas of clinical decision making are setting risk factor goals (for example, HbA_{1c}, and making treatment selections)

HOW PATIENTS WERE INVOLVED

I consulted with two older patients with type 2 diabetes and multiple comorbid illnesses. One patient endorsed the recommendation that tackling geriatric syndromes and avoiding hypoglycemia should be given as high a priority as preventing diabetic complications in older adults with diabetes. This patient also identified the importance of frequent communication between patients, primary care physicians, and specialists. The second patient recommended that the article be shortened. Both patients strongly endorsed the concept of treating all patients with diabetes with individually designed treatment. I have incorporated the comments about clinical team communication into the section on emerging treatments, and I shortened the manuscript. Both patients reviewed the manuscript before submission.

Integrating comorbidities into diabetes care

Decision support

Establishing a patient's prognosis and treatment preferences in order to set goals takes valuable time; without systematic processes in place to personalize and track goals, individualized goals may be difficult to recall and adhere to in complex patients. Completing and documenting these tasks accurately, quickly, and over time might be greatly enhanced with clinical decision support.

A systematic review created a conceptual framework of personalized diabetes care that illustrates the extent to which diabetes care can be personalized within the clinical decision making process (fig 2).[3] The two main areas of clinical decision making are setting risk factor goals (for example, HbA_{1c}, blood pressure, cholesterol) and making treatment selections. These two areas of decision making can be personalised on the basis of clinical factors (such as pharmacogenomics, comorbidity, life expectancy, stage of disease) and patients' preferences. Within this framework, four main areas of overlap exist where a decision can be personalised. In categories A and C in figure 2, clinical decisions are personalised on the basis of clinical factors; for categories B and D, clinical decisions are personalised on the basis of patients' preferences. Decision support is personalised when a decision aid or tool incorporates patients' clinical characteristics and/or treatment preferences into the clinical decision making process. The systematic review found that, among 13 decision support tools, only three were designed to involve the patient in diabetes decision making.[79-81] These tools attempted to elicit and incorporate patients' preferences about the selection of treatments (category D[79 81]) and, in one case, the selection of management goals (category B[80]). In general, these tools improved patients' knowledge, reduced decisional conflict, and increased patients' involvement in decisions.

Care management

One potential approach to improving care and outcomes for older patients with diabetes is to enhance both goal setting and care management, using population management techniques at a clinic level. A clinic could potentially use the electronic medical record to establish goals of diabetes care with automated prognostic calculators using existing data on demographics, comorbidities, and functional impairments. The electronic medical record could also help to encourage clinics and physicians to document goals of diabetes care on an annual basis. These documented goals could influence subsequent treatment decisions and help to improve coordination of care among multiple providers. However, once goals are established for a population, additional support for some patients may be needed to help them to achieve their goals. Clinics could target specialised care management programs to those older patients not achieving their personal goals and at high risk for barriers to self care. In concert with these efforts, clinics could target care specialised management for older patients who may be over-treated and may benefit from de-intensification of care.

Competing interests: None declared.

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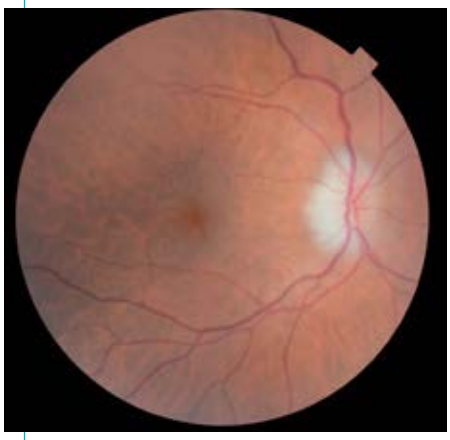
CASE REVIEW

Sequential vision loss in a patient with headache



A 74 year old woman with a history of bowel cancer and hypertension was admitted under the general medical team from the emergency department because of a constant frontal headache for several weeks and poor oral intake secondary to jaw pain, which was exacerbated by chewing. She described intermittent blurring of vision in her left eye, which had culminated in complete loss of vision three days before presentation. She felt generally unwell with increasing lethargy and generalised myalgia.

On clinical examination she had bilateral tender and pulseless temporal arteries. Funduscopy of the left eye showed features consistent with central retinal artery occlusion.

Initial blood tests showed raised inflammatory markers (C reactive protein 2438 nmol/L, erythrocyte sedimentation rate 116 mm in the first hour), and thrombocytosis (platelets 588×10^9/L). Despite symptomatic and biochemical improvement after prompt institution of appropriate treatment, her right eye deteriorated three days later exhibiting the features seen in the retinal photograph (figure). The optic nerve had a swollen pale "chalky white" appearance suggestive of an anterior ischaemic optic neuropathy.

1 What is the diagnosis?
2 How would you confirm or investigate this diagnosis?
3 What red flag symptoms should general practitioners be aware of?
4 How would you treat this condition?

Submitted by Siegfried Wagner and Saurabh Jain

Patient consent obtained.

Cite this as: *BMJ* 2016;353:i3055

SPOT DIAGNOSIS

A patient with cancer and nail pigmentation

A 32 year old African-American woman with stage 2B distorted B cell lymphoma of the cervix was admitted because of febrile neutropenia. Apart from fevers, she had black discoloration of her nails (figure). She had completed three cycles of a dose adjusted R-EPOCH regimen (rituximab, etoposide, prednisolone, vincristine, cyclophosphamide, doxorubicin) and also took acetaminophen (paracetamol)-hydrocodone, and ondansetron. The nail changes appeared after her chemotherapy sessions. She had no changes to her skin, lesions anywhere else, or a family history of skin cancer or melanoma. What is the diagnosis?

Submitted by Abhishek Maiti and Sreyasi Bhattacharya

Patient consent obtained.

Cite this as: *BMJ* 2016;353:i2346

Black discoloration of nails

We welcome contributions that would help doctors with postgraduate examinations.

We also welcome submissions relevant to primary care.

See thebmj.com/endgames

answers

CASE REVIEW

Sequential vision loss in a patient with headache

1 Giant cell arteritis.
2 Temporal artery biopsy, which should be performed promptly, is the diagnostic gold standard. It shows an inflammatory infiltrate and the presence of giant cells.
3 Suspect GCA in patients aged 50 years or more, especially those with polymyalgia rheumatica, new onset headache, or abnormality of the temporal artery (thickening, lack of pulsation, or tenderness). Other symptoms include visual disturbance, scalp tenderness, jaw claudication, and systemic features such as low grade fever, weight loss, and malaise.
4 Steroids are the mainstay of treatment—0.5-1 g/day intravenous methylprednisolone in patients with visual symptoms, or 40-60 mg/day oral prednisolone if visual symptoms are lacking, together with bone and gastric protection agents. Treatment should ideally start immediately in patients with visual deterioration and within 24 hours in others.

SPOT DIAGNOSIS

A patient with cancer and nail pigmentation

Chemotherapy induced melanonychia.

Thomas's sign

A woman presented with weight loss, jaundice, and silver coloured stools (figure). CA19-9 was raised and computed tomography suggested a pancreatobiliary tumour. Silver coloured stool, or Thomas's sign, is pathognomonic of carcinoma of the ampulla of Vater. The metallic colour is caused by the mixture of malaena and cholestatic pale stools. Ampullary cancers comprise about 0.2% of all gastrointestinal cancers. Although silver stools are thought to be a classic sign, data are limited. If caught early prognosis is thought to be good, highlighting the importance of obtaining an accurate history of stool colour change.

Ali Waqar (alibinwaqar@gmail.com), Giulio Preta, Hasan Haboubi, Department of Gastroenterology, ABM University Health Board, Swansea, UK

Patient consent obtained.

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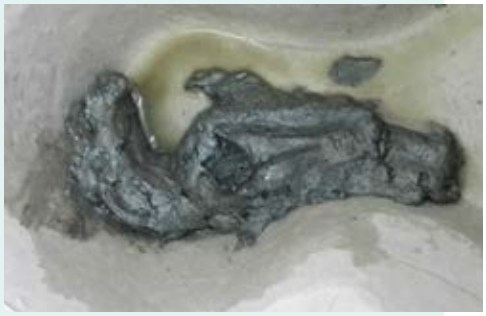

Refugees, neighbourhoods, and diabetes

The government decided where refugees who arrived in Sweden over 25 years ago should live. Investigators used this as a "natural experiment" to see if allocation of neighbourhood affected the incidence of type 2 diabetes in 61 386 refugees aged 25-50 years who arrived in 1987-91 (*Lancet Diabetes Endocrinol* doi:10.1016/S2213-8587(16)30009-2). Using the area deprivation index, they detected a statistically significant 9% extra risk of diabetes for every five years spent in a high deprivation versus a low deprivation area.

Silent heart attacks are common

How often does myocardial infarction (MI) occur without being picked up at the time? The Atherosclerosis Risk in Communities Study provided a baseline cohort of 9498 people without cardiovascular disease when recruited in 1987-89 for investigators to examine later electrocardiograms for changes of MI without documentation of clinical MI in the medical notes (*Circulation* doi:10.1161/CIRCULATIONAHA.115.021177). During a median follow-up of 8.9 years, 317 (3.3%) participants developed silent MI, whereas 386 (4.1%) developed clinical MI. Both types of MI were more common in men but outcomes were worse in women.

Systematically under-reviewing

Doug Altman was a pioneer of the evidence based medicine movement in the 1990s and set standards for how to generate evidence and combine it in systematic reviews. But when he and colleagues looked at a large sample of recent systematic reviews, they found that standards often fall short of the basic minimum (*PLoS Med* doi:10.1371/journal.pmed.1002028). Notably, only 7% looked for unpublished studies, and less than half considered the risk of publication bias.

You can't tell from the urine

"His urine looks very concentrated, doctor," "OK, push fluids" is a conversation that does not belong to this century. You cannot tell if an older person is dehydrated by urine parameters—specific gravity, colour, osmolality, cloudiness, additional dipstick measures, ability to provide a sample, or the volume of a random sample. Using serum osmolality as a reference, none of these measures provided any useful information in a study of 162 participants with a mean age of 86 years (*Am J Clin Nutr* doi:10.3945/ajcn.115.119925).

Consent for kids' trials

What we need is more Brussels bureaucracy—to help clinical trials involving children in Europe. A study of 25 EU member states and two European Free Trade Association countries until the end of 2014 shows a bewildering variety of different systems for consent and assent (*Arch Dis Child* doi:10.1136/archdischild-2015-310001). The authors have developed an "informed consent and assent tool kit" that could remove this obstacle if its use could be agreed across the EU.

Is 70 too old for palliative care?

In an analysis of four PhD submissions about the experiences of people dying in the community, researchers from Edinburgh found that patients aged 70 years or more were offered less palliative or supportive care than younger patients (*Eur J Palliat Care* 2016;23(3)), and that this often caused avoidable distress. Reasons may have been the lack of a clear diagnosis of "dying" in non-cancer conditions. Another may have been the reluctance of health professionals to involve palliative services for old people with complex conditions, who often experienced avoidable distress.

Ringing the changes

A systematic review of 228 tinnitus trials found 35 different outcome domains, 78 primary outcome instruments, and 24 different patient outcome tools (*Trials* doi:10.1186/s13063-016-1399-9). In 55% of trials the problem of interest was ill defined, and loudness was mentioned in only 14%. No wonder the report ends with a distinct whine.

Musical goosebumps

Investigators in the psychology department at Eastern Washington University have examined the phenomenon of music induced goosebumps, otherwise known as frisson or even "skin orgasm" (*Psychology of Music* doi:10.1177/0305735615572358). Minerva has gone one further and investigated whether such activation may be suppressed by a hot aqueous environment. Using recordings of the conductor Wilhelm Furtwängler, she has shown that musical goose pimples can readily occur in the bath.

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