disease risk assessment in deprived black and Asian communities, of whom 70% were referred for further tests to their GPs because of increased cardiovascular risk.[8] Nevertheless, adequately powered rigorous evaluations are lacking.

If near-patient testing is to be implemented in primary care, then quality assurance of the programme will be a key recommendation. This will include quality control maintenance and external quality control. Guidelines also recommend quality assurance of near-patient testing to limit medical errors, and a mechanism for continued quality improvement.[9] To help deliver the NHS Health Check programme, the recently published *A Practical Guide to Point of Care Testing* is therefore timely.[10] The guidance gives advice on quality assurance, the process for accreditation of healthcare professionals, and a buyers' guide to near-patient testing equipment.[10]

A systematic review of near-patient testing in primary care, published in 1999, concluded that there was little research evidence to guide expansion of the use of near-patient testing, and further research was recommended.[11] Ten years on, there has been little progress in terms of rigorous evaluations of near-patient testing initiatives in primary care. A recent guideline summarised some of the evidence base for near-patient testing, especially in emergency departments, but the evidence base for its impact in improving outcomes in primary care was lacking, except for monitoring of people on anticoagulants and for management of people with type 2 diabetes.[9] Near-patient testing has a number of potential benefits beyond patient satisfaction, although the full potential of its integration and implementation has not been exploited. Rigorous evaluations of translating this technology into primary care are still required to determine improvements in harder outcomes and cost-effectiveness.

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Tailoring treatment to risk in type 2 diabetes

Detecting and managing type 2 diabetes forms an increasing part of everyday practice, with prevalence estimates suggesting that 3.5–5% of the UK population are affected.[1] Although care has improved in recent years, partly because the Quality and Outcomes Framework (QOF) has encouraged systematic approaches to reducing metabolic risk, this success has prompted important questions about how aggressive therapy should be.

Managing hyperglycaemia is only part of diabetes care, but it seems to generate much of the controversy, with uncertainty about both the safety and affordability of new QOF targets[2] and medications.[3] On top of this, changes to the way that glycated hemoglobin (HbA1c) is reported will mean that clinicians need to spend time explaining the revised values to patients.[4]

In a sense, the paper from a Dutch group in this issue of the *BJGP*[5] confirms what we know from other observational studies:

that there is a near linear relationship between glycaemic control and death rates in people with type 2 diabetes.[6,7] Although in their interpretation the authors focus on the non-significance of the small excess mortality in those with only moderately raised HbA1c levels, the trend appears clear. There are other reasons not to read too much into the detail of their findings: this was a small cohort of 1149 people and, by current standards, the proportion prescribed a statin (11%) appears quite low. By way of comparison, in the EPIC-Norfolk population cohort,[7] a 1% higher HbA1c was independently associated with 28% higher risk of death, an association which extended below the diagnostic cut-off for diabetes. These results suggest that, as with blood pressure and cholesterol, over the longer term at least, the lower the HbA1c the better.

We have long been aware of the immediate risks of hypoglycaemia with insulin and sulphonylureas, but the ACCORD trial has highlighted the risks of adopting an aggressive treatment strategy for patients at risk of cardiovascular disease.[8] In the trial's intervention group, HbA1c fell from 8.1% to 6.4%, but this was associated with increased mortality. Although this led some to question the lowest of the three-tiered glycaemia targets, set at 7.0%, 8.0%, and 9.0% in the UK QOF,[2] the concern appears unfounded because the trial protocol was very different from everyday practice, and the lowest QOF target only relates to 50% of the whole population with diabetes. Reassuringly, the ADVANCE study[9] and the Veteran Affairs Diabetes Trial[10] found no increase in all-cause mortality in their intensive treatment groups. Also, long-term follow-up of the United Kingdom Prospective Diabetes Study demonstrated a 'legacy effect', with fewer deaths after 10 years in those initially managed intensively.[11]

A newly-published retrospective analysis of cohort data from the UK General Practice Research Database reopens the debate about how low to aim.[12] The study found that, among people whose treatment had been intensified by the addition of insulin or a sulphonylurea, there was no benefit in reducing HbA1c below 7.5%. The mortality rate was higher among those with the tightest control (this lowest decile of cohort had HbA1c below 6.7%; median = 6.4%). The reasons for this are unclear, but it may have arisen because of more frequent hypoglycaemic episodes as a result of their treatment regimen. While only a minority of patients with type 2 diabetes are treated with insulin or a sulphonylurea, the findings raise questions about the proportion of patients for whom a tight glycaemic target is appropriate.

Several clinical guidelines have been updated in the last 2 years. In the UK, the National Institute for Health and Clinical Excellence (NICE) recommends an HbA1c of 6.5% for people with type 2 diabetes in general,[1] whereas the American Diabetes Association (ADA) advises that this should be 7.0%,[13] but both targets are qualified by advice that they should be tailored to individual circumstances.

So which individuals are likely to benefit from tighter control, and which may be best served by accepting a higher level? Essentially this comes down to balancing risks and benefits; younger people with little comorbidity are more likely to reap the benefits of tighter control, whereas less stringent goals may be more appropriate for people with established cardiovascular disease, those with a history of hypoglycaemia, or those requiring multiple medications or insulin to achieve the target.

Reading the NICE and ADA guidelines, the evidence that has been marshalled is impressive, but it is the judgements made on that data that matter most for clinicians, patients, and those who will profit from, or pay for the medications recommended. Setting targets serves a purpose, but the specific figures are often accorded a spurious legitimacy, particularly when dealing with a continuous variable such as HbA1c. An example is the way that having adopted a target of 6.5% in general, NICE then sticks with this as the threshold for adding secondline treatments, including newer agents such as dipeptidyl peptidase 4 inhibitors (DPP-4 inhibitors: sitagliptin, vildagliptin) if metformin or sulphonylureas are inadvisable.[3] These drugs may cause less weight gain, but at a price of over £400 a year[14] they are hardly cost-effective for people with only marginally raised HbA1c.

Some commissioners (including NHS Cambridgeshire) have restricted their usage to hospital prescriptions; a surprising policy, given other initiatives to shift diabetes care to general practice. But the reason is not hard to fathom: with diabetes so prevalent, if new medications were widely used, there would be severe pressure on commissioning budgets. NICE has attempted to quantify this risk, and estimates that within 3 years, newer agents will cost £37 million annually, assuming that 6% of people with type 2 diabetes will be prescribed DPP-4 inhibitors, 2% will be prescribed exenatide, and that there will be significant reductions in the use of insulin.[14] Much of the extra cost arises from the recommendation to consider using second line drugs to achieve a target of 6.5%, which seems an inappropriately low threshold, given the limited potential for health gain.

So, glycaemic control is related to long-term health, but we need to be smarter about how to tackle it. Rather than focus efforts on achieving near-normal glucose for everyone, we should seek reductions across the distribution curve, set individual goals (and yes, discuss these with patients), so that more expensive and intensive treatments are deployed where they will bring most benefit.

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Case validation in research using large databases

Computerised healthcare databases (CHCDs) have been increasingly used in epidemiologic research and have become the single most used source of information in pharmacoepidemiology. A key feature in the selection of a computerised database for research is completeness and validity of the data. As Khan *et al* highlight in the present issue of the *BJGP*,[1] researchers should investigate their information source and how well it covers the diagnosis under study.

The validation process of a database is complex, and the resources required to implement a study protocol using CHCDs will vary widely depending on the need and amount of validation required. It all starts with the selection of a database with a track record of acceptable internal and external validity supported by data provided by the database owners and peer-reviewed studies by external researchers. The General Practice Research Database and The Health Improvement Network are primary care UK databases that meet these criteria.[2–5]

COMPUTERISED SEARCH

The second step in the validation process is to establish a good operational definition of the outcome of interest by constructing specific diagnostic algorithms using a list of codes from the corresponding clinical dictionary. This initial computerised search might also include objective eligibility (exclusion) criteria. This list may be specific if we are dealing with some hard endpoints, such as cancer, but will have to be more sensitive (and will therefore have greater potential for false positives) when studying events such as peptic ulcer bleeding that may be coded with loose terms such as haematemesis or melaena.

MANUAL REVIEW OF COMPUTERISED PROFILES

The third step is a careful and, therefore, time-consuming manual review of computer profiles of the individuals identified by the algorithms in the previous step (computerised search) in order to assign a case status to each patient (probable, possible, or non-case). This first clinical review will permit the researcher to assess whether the validity of the initial computer search strategy is acceptable (confirmation rate close to 90%) or whether more information is required. If needed, the researcher will request from the database owner additional clinical information that the GPs include in a free-text section. This can include information derived from their narrative account of the episode, including summaries from referral letters, discharge letters, and diagnostic procedures.

The free-text section can sometimes also include a complete copy of these letters that have been scanned in. This will lead to a second clinical review of the whole list of individuals detected with the initial computer search, or a random sample if the authors simply wish to confirm a high correlation with the first clinical review (the one without free text). Needless to say, to perform this computer profile review successfully, well-trained experts in the disease field of interest, funding, and time are required: the process may take up to 1 year.

GP VALIDATION

The fourth step is obtaining confirmation of the case status from the GP. This is done by contacting collaborating GPs using specifically designed questionnaires. In addition to the questionnaire, a researcher can request — through the database owner —