A systematic review of near patient testing in primary care

Authors' objectives
The objective was to assess the scientific background to the expansion of near patient testing (NPT) whilst identifying areas where future research is required. The review also assessed literature on the use of alternative delivery systems between laboratory and general practice, including electronic data interchange (EDI) and computerised diagnostic decision support (CDDS) in the primary care settings.

Searching
MEDLINE, databases on BIDS, the Science Citation Index, Index to Scientific and Technical Proceedings, EMBASE, GPlit, PsycLIT and CINAHL were searched from 1986 to 1995 using the keywords provided in the text. Additional published and unpublished studies were located by examining the bibliographies of identified articles and literature from the Department of Health and the Royal College of General Practitioners, by personal contact with collaborators, and through a comprehensive international postal survey; the latter was sent to the heads of academic departments of general practice and clinical chemistry, researchers worldwide (active or interested in the field), and commercial organisations.

Study selection
Study designs of evaluations included in the review
No inclusion criteria relating to the study design were specified.

Specific interventions included in the review
NPT: any pathology testing performed outside hospital laboratory settings, where the result is available without the sample being transported to a laboratory for analysis (e.g. tests for lipids, diabetes, urinalysis, drugs of abuse, pregnancy, allergy, cancer screening, infections and haematology).

Utilisation of alternative delivery systems between laboratory and general practice, including EDI and CDDS in primary care settings.

Reference standard test against which the new test was compared
No inclusion criteria relating to the reference standard were specified.

Participants included in the review
Patients in primary care settings.

Outcomes assessed in the review
The clinical effectiveness of NPT, the availability and reliability of NPT, and the cost-effectiveness of NPT were assessed.

How were decisions on the relevance of primary studies made?
Two internal assessors who had expertise, experience and had published original research in the field of NPT or CDDS, independently assessed relevance. Any disagreements were discussed by the whole steering group.

Assessment of study quality
The validity of the papers was appraised using a standard format, derived from the User's Guides to Medical Literature. Scores ranging from 5 (most reliable) to 0 (poor methodology) were assigned. Two reviewers independently assessed each paper. Any disagreements were re-examined by two members of the steering group.
Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

Methods of synthesis
How were the studies combined?
The studies were combined narratively.

How were differences between studies investigated?
The evidence was summarised separately according to different application areas.

Results of the review
Ninety-two papers relating to NPT, 8 to CDDS and 2 to EDI, were included.

The majority of publications containing original data relating to NPT were in the area of microbiology (26%), followed by desk-top analysers (22%) and diabetes (16%). The quality of the methodology was poor; most evaluations were subject to spectrum bias, and the reporting of the setting and the characteristics of the study population was poor. Only the desk-top analysers the Multistix 8SG and the Clearview Chlamydia test have been the subjects of studies of impact and cost-effectiveness in the general practice setting. The impact of EDI and CDSS on the quality of care has not been evaluated in the literature.

Cost information
Yes.

Authors' conclusions
This review did not indicate that there was any evidence to support the general introduction of NPT in general practice in preference to the existing laboratory service, other than as part of a rigorous, controlled evaluation. There may be specific clinical areas where NPT might provide additional value to the patients, particularly in the areas of early diagnosis, screening and the monitoring of chronic disease. The provision of additional diagnostic information during a consultation may enable primary care physicians to improve the quality and accuracy of their diagnoses, with potential benefit to the patients. Such selective introduction of NPT should only take place after evaluation.

Even if there was a substantial increase in NPT in primary care, the laboratory service would continue to provide its existing service, and may need to expand its role in support of quality control and training of practice staff. One potential means of introducing NPT into primary care is through laboratory outreach, although it remains to be evaluated. Specific practice protocols that give details of the clinical indications for testing, staff training and the necessary quality control procedures may be required to support the introduction of NPT.

There was evidence to suggest that desktop multi-analysers for the analysis of 'routine' samples, and urine multitest strips for confirming diagnoses of urinary tract infection in the presence of dysuria, are of limited value in general practice.

EDI may present advantages over traditional means of communication, but its introduction should be subject to evaluation.

CRD commentary
This was a well-conducted systematic review. The review answered a well-defined question and the inclusion criteria were clearly specified. Detailed literature searches that included attempts to identify unpublished studies were carried out. The authors reported details of the review process, including a detailed quality assessment, and appropriate attempts were made to prevent biases. The authors presented a narrative synthesis, which was appropriate given the data.
Implications of the review for practice and research

Practice: The authors stated that local hospital laboratories should have a major role in supporting NPT in primary care, particularly with respect to staff training and quality control.

Research: The authors stated that further, subject-specific systematic reviews are required that include laboratory and secondary care studies, and consider the potential for altering current management and patient acceptability. Priority topics include: biochemistry profiles on desktop analysers, cholesterol testing, urinalysis for the diagnosis of urinary tract infections, anticoagulation control, and NPTs for the identification of acute infection. A research programme to assess NPT in primary care would be appropriate: phase one initial reliability and safety; phase two - trials in selected populations; phase three - trials in unselected populations and cost-effectiveness and impact studies.

Further primary research is recommended where there is promising evidence, but where insufficient material exists to justify a further quantitative review: screening for iron deficiency in the child development clinic; NPT for deep venous thrombosis; NPT for haemoglobin A1c and microalbuminurea in the diabetic practice clinic; home monitoring of blood glucose by patients in tight control of diabetes; NPT for cardiac muscle damage in the diagnosis of acute chest pain; the comparison of EDI with current practice for routine results; the comparison of CDDS with EDI and specialist advice.

Bibliographic details

Original Paper URL
http://www.hta.ac.uk/project.asp?PjtId=893

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Cost-Benefit Analysis; Diagnostic Tests, Routine; Great Britain; Physicians’ Offices; Point-of-Care Systems; Pregnancy; Primary Health Care; Quality Control; Reagent Kits, Diagnostic; Reproducibility of Results; Technology Assessment, Biomedical

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.