CLINICAL PRACTICE

Inadequacy of primary health care test request guidelines – lack of an evidence base

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Evidence suggests that 3 - 4% of patient encounters in primary health care result in blood tests being requested.[1] There is compelling evidence of significant misuse and poor utilisation of many laboratory tests,[2] which results in an economic burden and other problems including further investigation of false-positive results.[1] Patients have high expectations that blood tests be performed and have little understanding of the limitations of testing.[3] The frequency of test ordering is much higher in the USA and Canada, for example, than in the UK, without any overt difference in the quality of care. There are suggestions that 30 - 50% of tests are unnecessary, and that about 15% of abnormal results are not acted upon.[4]

Postulates for the differences in testing frequency include the threat or perceived fear of medical malpractice litigation, but there is evidence that more litigation results from failure to act on test results than from not ordering tests *a priori*.[4]

Methods to improve test usage have been developed. One of the most effective ways is to redesign laboratory request forms to allow fewer choices, so reducing the number of tests ordered.[2] Use of order forms in conjunction with clinical practice guidelines is also effective in reducing test ordering.[1]

Ravensmead Community Health Centre (CHC) serves the community of Ravensmead in Parow Valley, Cape Town, as a primary health care centre. Health care staff are provided with a Spencer haemoglobinometer and a hand-held glucometer (Accuchek). Urine testing dipsticks (including for semi-quantitative ketones) and urine pregnancy tests (Pregnosticon) are also available. The supporting laboratory service is administered by the National Health Laboratory Service (NHLS), and the request forms and guidelines therein form the basis for this article.

The request form facing page has a very limited test menu, and it clearly states that no further requests should or will be entertained unless authorised by the '*Senior Medical Superintendent*'.

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The reverse of the request form has a section that states: '*These recommendations have been developed after wide discussion amongst medical officers, clinical nurse practitioners and the NHLS.*' This is encouraging as locally developed guidelines tend to accurately judge the applicability of evidence to local practice.[5] No mention is made of what evidence the regulations are based on, nor does it appear to be based on expert opinion, or, if so, it is not stated. The form also lists the rationale behind the guidelines for tests requested. We examined these recommendations and the discussions. A summary of the findings is presented in Table I.

Chemistry

The use of the prostate-specific antigen (PSA) test is controversial; many countries advocate the introduction of national screening programmes, but routine screening in low-risk groups is currently not justified.[6] However, in symptomatic patients it appears to be reasonable to allow PSA requests.

Hypothyroidism is commonly treated with replacement by levothyroxine sodium (Eltroxin). It is claimed that, once established on a stable dose, annual monitoring, although routine, is probably unnecessary except in elderly patients. However, many – sometimes approaching half of all hypothyroid patients receiving replacement thyroid hormone – have abnormal thyroid-stimulating hormone (TSH) results, reflecting inappropriate dosing.[7]

Cholesterol should be aggressively targeted, and it is established practice to measure high-density lipoprotein (HDL) cholesterol and low-density lipoprotein (LDL) cholesterol in primary care settings and to start statin therapy.[8] Currently, statin therapy may not be initiated at Ravensmead CHC but merely continued, if the prescription had been initiated at a specialist clinic.

Rheumatoid arthritis is a common debilitating disease which may be difficult to diagnose. Rheumatoid factor is a nonspecific marker of inflammation, and is generally used to monitor disease activity in rheumatoid arthritis, although with caveats.[9] It is a test that must be carefully performed to prevent erroneous results and is fraught with potential problems.[9] The injunction against specialised tests for rheumatoid pathology appears to be warranted.

Table I. Test request guidelines categorised as adequate or inadequate.

	Comments
Adequate	
INR	
Creatinine	
Potassium	
Lipase	
Urate	
Total bilirubin	
ALT	
ALP	
GGT	
Pregnancy test	
HIV	
RPR	
Drug levels	
MCV	
Inadequate	
PSA	Should be allowed in symptomatic patients
TSH	Annual monitoring of all patients on Eltroxin should be allowed
Hb	Technically able to perform required task but long-term stability dubious if no supporting structures in place
Cholesterol/triglycerides	At odds with evidence-based medicine and international guidelines
FBC	Indications for FBC are poorly defined
ESR	Useful for monitoring disease activity but should be performed in a laboratory and not in the clinic as suggested
WCC	Allows for rapid screening of suspected inflammatory or haematological diseases

ALP = alkaline phosphatase; ALT = alanine transaminase; CRP = C-reactive protein; ESR = erythrocyte sedimentation rate; FBC = full blood count; GGT = gamma - glutamyl transferase; HIV = human immunodeficiency virus; Hb = haemoglobin; HDL = high-density lipoprotein; INR = international normalised ratio; LDL = low-density lipoprotein; MCV = mean corpuscular volume; PSA = prostate specific antigen; RPR = rapid plasma reagin; TSH = thyroid-stimulating hormone; WCC = white cell count.

Haematology

The proposed clinical protocol for management of suspected anaemia is to make the diagnosis with a hand-held Spencer haemoglobinometer, give a trial of iron therapy for 2 months, and, if that is unsuccessful, refer the patient. The Spencer haemoglobinometer has long been used in the primary care setting and judged to be an adequate screening method for detecting anaemia.[10] Unfortunately, there are other considerations when providing a point-of-care testing device service, including staff training, health and safety considerations, quality assurance and ongoing maintenance.[11] Linegar *et al*. concluded that the haemoglobinometer was adequate for South African clinical practice with two caveats: firstly, that they obtained results within 5 - 8% agreement of an automated result by averaging the readings obtained by 3 trained staff, and secondly, that regular calibration was mandatory.[10]

A single haemoglobin measurement has low sensitivity and specificity for the diagnosis of iron deficiency.[12] Classically, the cause of the anaemia is determined to enable appropriate therapy. It appears reasonable that attempts to establish a cause for low Hb should be supplemented by the mean corpuscular volume (MCV) to categorise the type of anaemia and, if microcytic, a trial of iron therapy should be attempted; if not microcytic, the patient should be referred for investigation.[4]

C-reactive protein (CRP) is probably superior to erythrocyte sedimentation rate (ESR) in the first 24 hours following tissue injury and in children. However, ESR is still valid for clinical practice but is influenced by many factors, and quality control that cannot be achieved in a high-throughput primary health care setting is mandatory.[13] The full blood count (FBC), white cell count (WCC) and differential count allow rapid screening for serious disorders, and are some of the most requested tests.[14]

Design of the request form

The request form uses two common and effective methods of reducing test requests: offering a limited test menu, and issuing guidelines to guide clinical practice.

Although we highlight limitations in the current request form, several positives have come from requesting guidelines. Firstly, guidelines are effective in changing requesting habits and limiting costs and inappropriate testing. Secondly, they serve as a useful reference to clinicians as to the utility of tests. Thirdly, they assist clinicians to practise best medicine.[5] Fourthly, they remind clinicians of the truth of the old aphorism: 'Common things occur commonly'.

Recommendations

Guidelines should be developed as part of a structured process to consistently deliver the best practice of care to patients.[5] The limitations of the current request forms are varied, and include potential de-skilling of doctors. Patients also have expectations that should be addressed, one being blood tests. The treating clinician and the patient should discuss the indications and limitations of testing. Furthermore, the guidelines issued must be carefully framed by evidence; if not, they become inadequate and, at worst, potentially dangerous. Finally, a risk exists that tests that are not listed could be underutilised, even if appropriate to that setting.

Several characteristics of guidelines have not been addressed in these request forms. Guidelines should be drawn up by an

identified and contactable committee that must identify and assess the evidence, translate that evidence into guidelines, and critically and explicitly grade the quality of the evidence.[15] With the rapid pace of change in medicine, guidelines should be reviewed at regular intervals, and this aspect should be reflected in them.[5,15] Guidelines should also have clear tools and methods to monitor their use through regular audits.[5]

Overall, the request guidelines were reasonable in limiting test requests, but several important shortcomings need to be addressed.

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