Change of pathology request forms can reduce unwanted requests and tests

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ORIGINAL ARTICLE

Over recent years, medical laboratory practice has changed and developed beyond recognition. An increase in the level and technological sophistication of medical interventions, in addition to a growing and ageing population, has increased the workload, with a corresponding increase in overall costs. Simultaneous changes in attitudes and expectations from the users of the National Health Service (NHS) have demanded faster turnaround times within fixed budgets. Work by others has shown that the design of laboratory request cards can influence patterns of test ordering and possibly reduce inappropriate requests.

Background: Developments in clinical and laboratory medical practice have resulted in a large increase in laboratory workload, with considerable financial implications. It has been shown that the design of laboratory request cards can influence patterns of test ordering and possibly reduce inappropriate requests.

Aims/Methods: To redesign pathology request cards with a view to reducing inappropriate test requesting.

Results: A redesign of the request cards used by general practitioners in the Bradford area led to a significant reduction in the ordering of specific investigations.

Conclusions: The redesigning of pathology request cards can have a beneficial effect on test requesting.

METHODS

Until the end of 1998, a request form that listed 16 different biochemical and immunological tests was in regular use (table 1). This form, which was used by both hospital and community doctors, had been developed to enable fast data inputting and test ordering in the laboratory using barcodes printed on the form next to tick boxes. The barcodes could be scanned with magic wands attached to the laboratory computers. The request forms used in the community served by Bradford Trust were redesigned and tests more appropriate for hospital use were removed. We set out to study the effect that changes to the design of our laboratory request cards had on patterns of test requesting within the local general practices.

RESULTS

The number of times each investigation was performed and labelling was simplified in the new forms, but barcodes to facilitate data entry remained.

The tests studied were C reactive protein (CRP), rheumatoid factor, lactate dehydrogenase (LDH), and serum calcium. CRP and rheumatoid factor were removed from the form as individual check boxes. Calcium and LDH were originally included as components of the “chemotherapy” profile. Calcium was also included in the “renal” profile.

The number of times each investigation was performed was established from the laboratory records over a two year period. This period spanned the change in request form design. The data for each test were analysed using a Poisson regression model, with intervention and month as factors in the model, and with year as a covariate. Analysis was performed using Statacorp Statistical Software Release 8.0.

Abbreviations: CRP, C reactive protein; LDH, lactate dehydrogenase; NHS, National Health Service
reductions in request rate for rheumatoid factor and CRP were smaller but nevertheless highly significant at 73% and 70% of the original request rates, respectively. Table 3 shows the incidence rate ratio data. The rheumatoid factor requests showed a month on month growth rate of approximately 7% after they were removed from the form (fig 3). This is in keeping with our current overall increase in workload. CRP showed a significant decrease in the number of requests, although there has been a pronounced increase in the number of requests in the follow up period (fig 4). This may reflect the increasing use of CRP instead of the erythrocyte sedimentation rate.

DISCUSSION

Research, particularly in the Netherlands, suggests that request cards with multiple check boxes increase laboratory requests and discourage the rational ordering of investigations. Our study also supports the idea that multiple tick boxes can encourage excessive and probably inappropriate requesting, simply by offering a list of easily accessible tests that may not have been foremost in the clinician’s mind. The continued increase in rheumatoid factor requests at the expected rate in our study suggests that their removal from the request cards did not have a deleterious effect on appropriate usage. These tests have specific indications and tend not to be treated as “profiles”.

“Our study also supports the idea that multiple tick boxes can encourage excessive and probably inappropriate requesting, simply by offering a list of easily accessible tests that may not have been foremost in the clinician’s mind”

Our work also illustrates the importance of using clear labelling and explanations of the individual test components of a composite request. For example, ticking the “chemotherapy” profile on the original form actually ordered a serum urate, LDH, calcium, and urea and electrolytes. When this was removed, LDH testing underwent a large reduction. This probably reflects the highly ambiguous nature of profiles, which were originally included for perceived ease of use by clinicians and the laboratory.

Table 2 Tests listed from January 1999

<table>
<thead>
<tr>
<th>Test</th>
<th>Number of requests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea and electrolytes</td>
<td>3500</td>
</tr>
<tr>
<td>Blood glucose</td>
<td>3000</td>
</tr>
<tr>
<td>HbA1C (glycated haemoglobin)</td>
<td>2500</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>2000</td>
</tr>
<tr>
<td>Lipids (cholesterol and triglycerides)</td>
<td>1500</td>
</tr>
<tr>
<td>Liver function tests</td>
<td>1000</td>
</tr>
<tr>
<td>Menopause</td>
<td>500</td>
</tr>
<tr>
<td>Thyroid screen</td>
<td>0</td>
</tr>
<tr>
<td>Thyroid on treatment</td>
<td>50</td>
</tr>
</tbody>
</table>

Table 3 Incidence rate ratio (IRR) data

<table>
<thead>
<tr>
<th>Test</th>
<th>IRR</th>
<th>95% CI</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>0.38</td>
<td>0.37 to 0.39</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>LDH</td>
<td>0.21</td>
<td>0.16 to 0.29</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>RF</td>
<td>0.73</td>
<td>0.68 to 0.78</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>CRP</td>
<td>0.70</td>
<td>0.66 to 0.74</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

CI, confidence interval; CRP, C reactive protein; LDH, lactate dehydrogenase; RF, rheumatoid factor.

Figure 1 Calcium requests against time.

Figure 2 Lactate dehydrogenase requests against time.

Figure 3 Rheumatoid factor requests against time.

Figure 4 C reactive protein requests against time.

In the cost conscious NHS, it is important that investigations are ordered in a rational and appropriate manner. Any change in the design of request cards should always be made with this in mind. Unfortunately, the data available on influencing patterns of requesting are scanty. Zaaij et al showed an 18.5% reduction in blood test requesting using a redesigned form. The benefit from this was lost as soon as
practitioners were allowed to revert to their original request form. Others have shown that education strategies can improve the rationality of test ordering in the short term, but without long term feedback the effect is short lived. Smellie et al. showed how the development of coronary prevention patient categories could be used to encourage the rational and appropriate use of the laboratory investigation of lipid profiles. The effect of such strategies might produce a more durable change in clinical behaviour.

At a time when the NHS is becoming ever more cost conscious and competitive, there is a need to develop effective strategies for promoting rational and cost effective test requesting. Our study illustrates the significant effect that a change in request card design can have on the rate of test ordering.

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