Junior psychiatrists’ electrocardiogram interpretation skills

AIMS AND METHOD
We checked whether psychiatric junior doctors could identify common electrocardiogram (ECG) abnormalities. Participants were directly approached at three London sites during induction or teaching programmes.

RESULTS
The survey had a total response rate of 65% (36/55). Psychiatry junior doctors displayed an overall success rate of 97% in detecting whether an ECG is grossly abnormal, but were much less competent in specifying exact ECG diagnoses (success rate of 41%). Accuracy rates for some diagnoses (e.g. paced rhythm) fell to as low as 11%. General practitioners performed no better than psychiatry trainees.

CLINICAL IMPLICATIONS
There is little consensus about minimum acceptable standards in medical skills such as ECG reporting in junior doctors. These competencies are generally ignored in new curricula. Questions regarding the appropriate remit of psychiatry doctors in this area are raised and the need for more monitoring and education of these skills is queried.

Method
An ECG skills questionnaire was devised involving the interpretation of five electrocardiograms. For each, the doctor was asked whether the ECG was normal or abnormal and, if abnormal, to state the abnormality. The five ECGs were as follows:

1. left bundle branch block
2. atrial fibrillation
3. inferior myocardial infarction
4. paced ventricular rhythm
5. normal.

Respondents were also asked to identify their senior house officer level as a psychiatry trainee year 1, 2, 3, 3+ or as a General Practice Vocational Training Scheme trainee.

Junior psychiatry doctors at three hospitals in London were approached in person to complete the test. At two sites participants were ‘captured’ on the first day of induction and at the third site before a tutorial in their formal teaching program. Questionnaires were completed anonymously and collected as a batch the same day.

Results
The overall response rate was 65% (n=36/55). A previous pilot at one site relying on ECG questionnaires being sent back resulted in dismal response rate of 10%. The success
rates of participants being able to identify each ECG correctly as grossly normal or abnormal without having to specify the diagnosis is outlined in Table 1.

Most junior doctors were highly accurate in identifying whether an ECG was normal or abnormal, with a total average success rate of approximately 97%. The two abnormalities misinterpreted as normal were left bundle branch block and atrial fibrillation. Interpretation accuracy falls dramatically, however, if participants are judged on their ability to name the ECG abnormality precisely. Success rates for this exercise are shown in Table 2.

Beyond the recognition of atrial fibrillation (80% success rate), doctors struggled with identifying the other abnormalities of an inferior myocardial infarction (36%), left bundle branch block (31%), and the paced rhythm (11%). However, if more approximate answers were accepted (e.g. ‘bundle branch block’ or ‘conduction abnormality’ for left bundle branch block or a more general term of ‘ischaemia’ for inferior myocardial infarction), interpretation ‘accuracy’ for inferior myocardial infarction and left bundle branch block improved to 83% (n=30/36) and 58% (n=21/36) respectively. The overall interpretation accuracy was 40%.

Results stratified by trainee level/background are shown in Table 3. Average accuracies for identifying ECG as grossly normal or abnormal and naming ECG abnormality correctly are shown.

There were no marked differences noted when considering the effect of trainee background on interpretation accuracy. General practitioner trainees scored no better than their psychiatry colleagues at ECG interpretation and in this sample were marginally worse at identifying whether an ECG was grossly normal or abnormal.

**Discussion**

Overall, psychiatry junior doctors appeared reasonably competent at identifying an ECG as grossly normal or abnormal but much less accurate at making exact ECG diagnoses. Perhaps the most important skill is to know when to seek advice in situations of uncertainty. Most consultants would hope that their juniors would autonomously seek expert help when needed but it is unclear how often these subjects are explicitly discussed in supervision (Cottrell, 1999). Computer-generated ECG reports cannot be relied on to help as they do not appear to reduce interpretation errors in junior doctors (Goodacre & Webster, 2001).

There is little consensus about minimum acceptable standards in ECG reporting in psychiatric trainees. The new Member of the Royal College of Psychiatrists (MRCPsych) curriculum and work-based assessments generally ignore this competency. On the face of it, these results appear fairly respectable for a cohort of psychiatry trainees. Casualty senior house officers, by comparison, are known to have high error rates when interpreting ECGs (Goodacre & Webster, 2001). A 97% success rate is, of course, no consolation if you are the patient who has had their ECG misread. In this study, both left bundle branch block and atrial fibrillation were misinterpreted as normal on one occasion each. If, for example, arrhythmia were the acute result of a myocardial infarction or some other serious pathology, the error could be fatal.

Most patients (and consultants) would obviously hope for complete accuracy but the way to strive for and achieve this is uncertain. Many junior doctors during the study said they would welcome formal training or refresher courses in ECG reading. Such courses are available nationally but they are expensive. Moreover,

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**Table 1. Participants’ success rates in identifying grossly normal or abnormal ECG**

<table>
<thead>
<tr>
<th>ECG abnormality</th>
<th>Participants successful in identifying ECG as grossly normal or abnormal, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LBBB</td>
<td>35 (97)</td>
</tr>
<tr>
<td>Atrial fibrillation</td>
<td>34 (94)</td>
</tr>
<tr>
<td>Inferior myocardial infarction</td>
<td>35 (97)</td>
</tr>
<tr>
<td>Paced rhythm</td>
<td>35 (97)</td>
</tr>
<tr>
<td>Normal ECG</td>
<td>34 (94)</td>
</tr>
</tbody>
</table>

LBBB, left bundle branch block; ECG, electrocardiogram. 1. n=36.

**Table 2. Participants’ success rates in identifying an ECG abnormality**

<table>
<thead>
<tr>
<th>ECG abnormality</th>
<th>Participants who could specify ECG abnormality, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LBBB</td>
<td>11 (31)</td>
</tr>
<tr>
<td>Atrial fibrillation</td>
<td>29 (81)</td>
</tr>
<tr>
<td>Inferior myocardial infarction</td>
<td>13 (36)</td>
</tr>
<tr>
<td>Paced rhythm</td>
<td>4 (11)</td>
</tr>
<tr>
<td>Normal ECG</td>
<td>–</td>
</tr>
</tbody>
</table>

LBBB, left bundle branch block; ECG, electrocardiogram. 1. n=36.

**Table 3. Relationship between participants’ medical background and their success rates in identifying and naming ECG abnormalities**

<table>
<thead>
<tr>
<th>Trainee background</th>
<th>ECGs successfully identified as grossly normal or abnormal (%)</th>
<th>Correctly identified ECG abnormalities (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All psychiatric trainees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 1 (n=3)</td>
<td>100</td>
<td>33</td>
</tr>
<tr>
<td>Year 2 (n=11)</td>
<td>96</td>
<td>45</td>
</tr>
<tr>
<td>Year 3 (n=5)</td>
<td>100</td>
<td>45</td>
</tr>
<tr>
<td>Year 3+ (n=4)</td>
<td>100</td>
<td>31</td>
</tr>
<tr>
<td>All psychiatric junior doctors (n=23)</td>
<td>98</td>
<td>42</td>
</tr>
<tr>
<td>GP VTS (n=6)</td>
<td>93</td>
<td>42</td>
</tr>
<tr>
<td>Unknown background (n=7)</td>
<td>94</td>
<td>36</td>
</tr>
<tr>
<td>All trainees (n=36)</td>
<td>97</td>
<td>38</td>
</tr>
</tbody>
</table>

GP VTS, General Practice/Vocational Training Scheme.
their effectiveness is uncertain and there is no evidence-based minimum number of ECG interpretations that is considered ideal for maintaining interpretation skills (Salerno & Alguire, 2003). Local tutorials conducted by local cardiologists could be a good accessible starting point.

Shared care arrangements for patients are another possible solution in reducing the ‘burden’ of preserving ECG interpretation (and other medical skills) in psychiatric doctors. Primary care involvement and shared care is encouraged in National Institute for Health and Clinical Excellence guidance for the monitoring of physical health of individuals with schizophrenia. Lester (2005, p. 134) suggested that, ‘Clear roles and responsibilities around mental and physical healthcare within a shared care approach . . . might lead to better quality physical care and eventually to a reduction in morbidity and mortality rates’. An opposing view would be that this arrangement can lead to medical de-skilling of psychiatrists.

Limitations

This study has several limitations. The absolute number of respondents is low and results would have been amenable to formal statistical analysis if a larger group could have been tested. The response rate of 65% also makes a responder bias likely with the possibility of weaker trainees not returning their surveys and inflating interpretation accuracy rates. It was apparent during our survey that many psychiatric junior doctors were very nervous and reluctant to be tested on ‘rusty’ medical skills.

Despite these limitations, we have shown that psychiatry trainees appear to be reasonably competent in detecting whether an ECG is grossly abnormal, but are much less competent in specifying exact ECG diagnoses. It is likely that trainees will be exposed to more ECGs in the future as part of a greater appreciation of the need to screen for physical illnesses in our patient groups. This increasing need should be reflected in postgraduate specialty curriculums.

Declaration of interest

None.

References


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Junior psychiatrists' electrocardiogram interpretation skills
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Access the most recent version at DOI: 10.1192/pb.bp.107.018960

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