The educational value of ward rounds in conveying knowledge and developing trainees' clinical skills

The ward round is a complex task, which has been described as 'walking a tightrope'. This article reviews the available literature on the educational value of ward rounds in conveying medical knowledge and developing trainees' history taking and clinical examination skills.

The ward round is a complex task, which has been described as 'walking a tightrope' (Reece and Klaber, 2012). The medical teacher needs to balance service demands with the educational needs of learners and often has to teach multiple learners who have different learning objectives (Roy et al, 2012). The rotational nature of training and the shift-work pattern of learners add to the complexity of this educational activity (Chaponda et al, 2009).

The ward round can offer an ideal educational opportunity for bedside teaching of history taking and physical examination skills. These skills combined with medical knowledge are the cornerstone of clinical medicine and can lead to 75–95% of diagnoses without the use of laboratory, radiological or other investigations, which in most cases help to confirm rather than establish the diagnosis (Kroenke et al, 1997; Arapakis, 2006). This article reviews the medical education literature in order to identify the educational value of ward rounds in conveying medical knowledge and helping learners develop their history taking and clinical examination skills.

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Methods

Relevant literature was identified through a search of the online databases (MEDLINE, EMBASE) using a number of key words (e.g. teaching rounds, ward rounds, attending rounds, work rounds, physical examination, history taking, knowledge) either alone or in combination. A range of publications were retrieved and a thorough review of titles and available abstracts demonstrated that a subset of 22 articles were relevant. Both old and more recent articles were included in this review, as long as they were relevant to the overarching question. The literature search was not limited to UK-based studies, but included international publications, such as research studies, discussion papers and short reports. The authors included publications from a range of different specialties, including medicine, surgery, gynaecology and paediatrics. However, papers on bedside teaching which focused on other skills, such as communication, management or teamworking skills, were not included as they were beyond the scope of this review.

Critical literature review

The relevant literature was organized into the following themes:

Types of ward rounds

Reece and Klaber (2012) described three main types of ward rounds: trolley or board round, sit-down 'grand round' discussion, and cot or bedside round, and analysed their advantages and disadvantages. They argued that the cot or bedside round is ideal for teaching physical examination skills, demonstrating practical signs and giving learners immediate feedback, but less effective in teaching history-taking skills. In contrast, the sit-down 'grand round' cannot be used to teach practical skills, but is helpful in building the learners' knowledge base and clarifying aspects of the patient's history. Finally, the trolley or board round allows a thorough discussion about patients, thus helping with knowledge acquisition, but is not useful for teaching physical examination skills.

The paper by Reece and Klaber (2012) was a qualitative study and the ideas came from discussions with 90 paediatricians across the UK. Although it is a large scale study, these results may be more relevant to paediatric ward rounds. In reality the division of ward rounds into these three types is artificial, because most ward rounds tend to be a blend of these types and this is acknowledged by the authors. In addition, although the authors mention that the paediatricians were divided into small groups to discuss their ideas, the methodology of creating codes and themes is not described and therefore the potential for bias cannot be excluded. This was the only study identified in the literature search describing specific skills that could be learnt on different types of ward rounds.

Learner perceptions of the educational value of ward rounds

Only a few studies have investigated the educational value of ward rounds in relation to knowledge acquisition, history taking and physical examination skills. These report mixed views of trainees, which may partially reflect differences in their settings (countries, hospitals), or participants (students, house staff, fellows) and their learning needs.

Some authors report that ward rounds are not a very valuable learning experience. Claridge (2011) performed a qualitative study in Southampton looking into the educational value of ward rounds for foundation trainees and found that only a small proportion of them (27%) felt that ward rounds provided a good opportunity to learn physical examination, or history taking (36%). This was a well-designed study

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with good response rates (62%) in the questionnaire survey. The author triangulated his findings with small group discussions to get a deeper understanding. However, it was a single-centre study at a large tertiary centre and therefore these results may not be applicable to other settings, such as district general hospitals.

Another study looking into learners' perceptions on internal medicine ward rounds was performed in Pakistan (Tariq et al, 2010). It included 134 participants who reported that clinical skills and bedside examination were competences not adequately covered through teaching during ward rounds. In contrast, learners felt that knowledge acquisition was fairly well covered. This study's strengths include a relatively large sample size which consisted of both postgraduates and undergraduates, representing a broad range of trainees. However, the sample was selected by convenience sampling which could lead to selection bias, the findings were not triangulated by methods other than a questionnaire survey and the study took place in a tertiary centre which was one of the top academic institutions in Pakistan, thus limiting the generalisability of the results.

In contrast, others report that ward rounds are a useful learning opportunity. Dewhurst (2010) performed a study in Chichester looking into the educational value of post-take ward rounds. Participants included house officers, senior house officers and registrars, who reported that post-take ward rounds provided a good opportunity for learning history taking and physical examination both by direct observation of the consultant during patient examination, and by offering opportunities for constructive feedback to trainees on their performance. This was a well-designed study with random selection of trainees at different levels of training that used focus groups to capture their opinions. Regarding its limitations, this was a single-centre study in a district general hospital that assessed the value only of post-take ward rounds, instead of all ward rounds. More importantly, the lead investigator was a hospital consultant and could have received biased responses from trainees, depending on their professional and personal relationship with the consultant.

A study of student perceptions of the educational value of ward rounds in Kuwait reported that bedside examination was the best covered competency in both medical and surgical rounds (Al Mutar et al, 2013). Medical knowledge improvement was another advantage of ward rounds for the students. Both these learning objectives were better met on medical than surgical ward rounds. This was a cross-sectional single-centre study with good response rates (only 12% drop-out rate). Its limitations include the limited applicability of the results to other centres, the increased risk of 'recall bias' (as questionnaires were completed long after the students had done their medical and surgical rotations), and the lack of triangulation of the results. On the positive side, this was a relatively large study with 141 participants and although it was single-centred, the students rotated through different hospitals of the University of Kuwait, increasing the generalisability of the results.

Teacher perceptions of the educational value of ward rounds

There are a few studies in the literature that report on teacher perceptions of the educational value of ward rounds and most of these were conducted in the United States. In general, teachers share positive views.

Gonzalo et al (2013) in a multicentre American study investigated the value of bedside rounds from a teacher perspective and reported that nearly all the participants felt that these were vital for students' and residents' development of core clinical skills. The study concluded that ward rounds gave trainees the opportunity to acquire history-taking skills and develop their physical examination skills, specifically through observation, real-time feedback and role modelling.

Boutros and Della-Ratta (1994) performed a US-based study of internal medicine programme directors' perceptions on the goals of ward rounds. They concluded that programme directors perceive ward rounds as primarily a patient care task with teaching and evaluation being secondary concerns. In terms of the educational aspects of ward rounds, about 75% of participants considered demonstration of examination techniques as a goal of the round, whereas didactic teaching (46%), assessing knowledge (70%) and providing literature references (32%) (surrogate markers of knowledge acquisition during the round) were reported less frequently as desirable goals.

Claridge (2011) argued that none of the medical registrars in Southampton agreed that ward rounds offer a good opportunity to teach physical examination skills. In contrast, 57% felt that they provided a good opportunity to teach history-taking skills. This was a well-designed study with acceptable response rates (52% in the registrar group), and included triangulation of its findings by obtaining views of both learners and teachers and by investigating these with questionnaires and focus groups. It was, however, a single centre study at a large university hospital which may affect the generalisability of its results.

Barriers to effective teaching and learning on ward rounds

There is general agreement in the literature regarding the barriers to effective bedside teaching, which are summarized in *Table 1*.

Service pressures

Several authors agree that time constraints (Ways et al, 1996; Kroenke et al, 1997; Dewhurst, 2010; Claridge, 2011) and the large number of patients (Ways et al, 1996; Claridge, 2011) are limiting the effectiveness of bedside teaching.

System-related factors

Changes to the working patterns of junior doctors, such as the European Working Time Directive (Chaponda et al, 2009; Dewhurst, 2010) and the rotation system of foundation trainees (Bleakley, 2002), are also limiting the learning opportunities on ward rounds. Chaponda at al (2009) reported that the vast majority of post-take

Table 1. Factors that impede education during ward rounds

Factors	Examples
Service pressures	Time constraints and large number of patients
System-related	European Working Time Directive and the rotation system of foundation trainees
Teacher-related	Lack of interest to teach and lack of teacher competence in bedside examination
Patient and ward-related	Patient compliance, availability, physical constraints, emotional and cognitive barriers

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ward rounds occur in the absence of the junior doctors who assessed the patient, so there is no opportunity to provide feedback on their performance. This was a well-designed prospective observational study in Liverpool, although it only involved a single centre and only covered a 1-week period. Bleakley (2002) in his discussion paper, based mainly on sociology and anthropology theories, argued that foundation trainees need to adapt to new subcultures when they rotate and that failure to learn the rules of a local community of practice may affect their learning opportunities. This paper is grounded in appropriate theories and is an interesting piece of work.

Teacher-related factors

Lack of interest in teaching (Qureshi and Swamy, 2008) and lack of teacher competence in bedside examination (Kroenke et al, 1997) have also been reported as barriers to bedside teaching.

Patient- and ward-related factors

Patient factors, such as compliance, availability and physical constraints (such as intravenous lines or catheters), as well as emotional and cognitive barriers (such as pain or dementia), can have a negative impact on ward round teaching (Kroenke et al, 1997; Claridge, 2011). The ward environment is sometimes too noisy or busy with frequent bleep interruptions to allow effective teaching (Qureshi and Swamy, 2008; Claridge, 2011). There is often a large number of learners on the round and group heterogeneity can be an additional challenge (Kroenke et al, 1997; Crawshaw, 2010).

Suggestions for improving bedside teaching

Several suggestions have been made in the literature about ways to improve the quality of bedside teaching in general. This section presents those suggestions which may be relevant specifically to the teaching of medical knowledge, history taking and physical examination skills. Some of these suggestions are outlined in *Table 2* in the form of top tips that could be used to improve teaching on ward rounds.

Structuring the ward rounds

Several authors agree that ward rounds should be structured in order to maximize learning. Stanley (1998) performed a well-designed observational study of the structure of ward rounds in four hospitals in the Anglia region. She observed that ward rounds which included a pre-ward round or a post-ward round meeting created opportunities for learning from service, mainly through their potential to allow time for questions, for feedback and for planning the on-the-job teaching agenda. This was a large scale UK-based study with a sound methodology that provided a good description of the structure of ward rounds and the potential usefulness of formal discussion times structured into ward rounds. However, it did not evaluate the quality of the teaching delivered, which is a crucial factor affecting learning.

Qureshi and Swamy (2008) also reported that gynaecology trainees in Wales thought that ward rounds should be structured, bleep-free sessions, in order to improve their educational value. They also suggested that keeping a diary of the cases discussed in the form of a logbook would be useful to avoid repetition.

Claridge (2011) concluded that ward rounds should be broken into manageable parts in order to reduce physical and mental fatigue and that additional learning opportunities can be provided by having breaks away from the clinical environment. The strengths and weaknesses of the last two studies have been discussed previously.

Abdool and Bradley (2013) and Ker et al (2009) discussed the importance of preparation before the ward round (knowledge of patients, learners and curriculum, setting objectives beforehand), devising a roadmap and assigning specific roles to learners, summarizing learning points, providing feedback and reflecting on it. These provide additional structure to ward rounds, but are presented as personal opinions based mainly on experience within a discussion paper. Although these ideas sound reasonable, the authors do not discuss the issue of time pressures, which is a major factor limiting their implementation.

Timing and time management

Claridge (2011), in his study on the educational value of ward rounds for foundation trainees, concluded that morning ward rounds were more effective than afternoon rounds, in which the focus is shifted on getting the jobs done and learning opportunities are missed in a 'business-model' round. In addition, an emerging theme from the focus group discussions was that ward rounds should offer targeted, limited and quality teaching, because prolonged ward rounds lead to physical and mental strain. In their observational study of post-take ward rounds Chaponda et al (2009) suggested that rounds held at 6 am and 6 pm would allow attendance of the clerking team and time for teaching and immediate feedback. However, this suggestion may prove unpopular with consultants and may not be applicable to other hospitals, where shift changes and post-take ward rounds occur at different times.

Multilevel teaching

Certain et al (2011) performed a unique study, which described nine techniques of teaching learners at different levels of training and compared their effectiveness using a

Table 2. '10 top tips' to improve teaching on ward rounds

Roadmap	Agree with trainees the agenda and educational needs
Focus of encounter	Choose an area of clinical skills development
Preparation	Prepare session based on trainees' learning objectives and level of training
Consent	Patients should be consented in the absence of learners
Role assignment	Active participation minimizes barriers between educator and learner
Multilevel teaching	Ensure that trainees of all levels can engage
Time and timing	Choose the right time and duration
Summarize	Close session by summarizing the key points
Feedback	Provide individualized and constructive feedback and receive trainee feedback on your teaching
Reflection	Reflect on trainee feedback in order to improve the quality of future encounters

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trainee questionnaire survey of 177 residents and 65 medical students at Massachusetts General Hospital. Broadening (asking 'what if?' questions to create more challenging theoretical scenarios), targeting (targeting questions at specific team members based on their difficulty) and novelty (offering new data, such as a newly published article) were considered most effective. Although this was a fairly large study with reasonable response rates (37%), its weaknesses are that it was performed in a single academic institution, it did not triangulate its findings through focus groups, and it did not take into consideration the impact of individual teaching styles on the effectiveness of each technique.

Active participation

Many authors have discussed the importance of trainee active participation on ward rounds and the quality of most of these studies has been evaluated previously (Stanley, 1998; Birtwistle et al, 2000; Ker et al, 2009; Dewhurst, 2010; Reece and Klaber, 2012; Abdool and Bradley, 2013). Prado et al (2011) performed an interventional study which compared an active method of instruction (based on interaction and self-directed learning) to a traditional methodology (based on passive learning using short lectures). The study evaluated the effectiveness of each method using multiple choice questions and showed that the active method was more effective. This study design had multiple weaknesses, including lack of blinding, not taking into account collateral learning or the quality of teaching delivered, and the fact that multiple choice questions may not be a reliable means of assessing knowledge acquisition.

Use of technological aids

Technological aids used in education are a rapidly developing field, supplementing traditional teaching methods and are already embraced by medical educators (Sandars and Haythornthwaite, 2007). E-learning has become commonplace in medical education and mobile technologies have attracted great attention. Using portable computers and smart phones during the ward round allows access to the internet, apps and other learning material, such as patients' investigations, that can further enhance learning in close conjunction with the more traditional bedside teaching. Audio and video files (podcasts and vodcasts respectively) can be downloaded to portable computer devices and wikis and blogs are websites that allow creation and modification of learning material (Doherty and McKimm, 2010).

Conclusions

The educational value of ward rounds in relation to knowledge acquisition and the development of history taking and physical examination skills is an under-researched area. There are only a few research papers on this topic with fewer good quality studies. These have been performed in very different settings (countries, hospitals, assessing different types of ward rounds) and have involved different participants (learners at different levels of training, teachers) which may largely account for the mixed views.

In general, teachers value the educational aspects of ward rounds, but learners express mixed opinions. There is consensus in the literature regarding the barriers to effective bedside teaching (service pressures, system-, teacher-, patient- and ward-related factors) and suggestions for improving bedside teaching (modifying the structure of ward rounds, optimizing the timing and time management of ward rounds, using multilevel teaching strategies and encouraging trainee active participation). Further research is needed regarding the educational value of ward rounds with good quality studies using a variety of different methods (not only questionnaire surveys) to get a deeper understanding from both a learner and teacher perspective. **BJHM**

KEY POINTS

- The ward round is a complex task which has been described as 'walking a tightrope'.
- The educational value of ward rounds in conveying knowledge and developing trainees' clinical skills is an under-researched area.
- In general, teachers value the educational aspects of ward rounds, but learners express mixed views.
- There is consensus in the literature regarding the barriers to effective bedside teaching and suggestions for improving its quality.

Conflict of interest: none.

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