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# Multi-disciplinary team meetings in stroke rehabilitation: an observation study and conceptual framework

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## Abstract

**Objective:** To explore how multi-disciplinary team meetings operate in stroke rehabilitation.

**Design:** Non-participant observation of multi-disciplinary team meetings and semi-structured interviews with attending staff.

**Setting and participants:** Twelve meetings were observed (at least one at each site) and 18 staff (one psychologist, one social worker; four nurses; four physiotherapists four occupational therapists, two speech and language therapists, one stroke co-ordinator and one stroke ward manager) were interviewed in eight in-patient stroke rehabilitation units.

**Results:** Multi-disciplinary team meetings in stroke rehabilitation were complex, demanding and highly varied. A model emerged which identified the main inputs to influence conduct of the meetings were personal contributions of the members and structure and format of the meetings. These were mediated by the team climate and leadership skills of the chair. The desired outputs; clinical decisions and the attributes of apparently effective meetings were identified by the staff. A notable difference between the meetings that staff considered effective and those that were not, was their structure and format. Successful meetings tended to feature a set agenda, structured documentation; formal use of measurement tools; pre-meeting preparation and skilled chairing. These features were often absent in meetings perceived to be ineffective.

**Conclusions:** The main features of operation of multi-disciplinary team meetings have been identified which will enable assessment tools and interventions to improve effectiveness to be developed.

## Keywords

Stroke, team, meetings, structure and function, decision making

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## Introduction

Multi-disciplinary teams have been the preferred model of service delivery for complex, chronic conditions, for many years.<sup>1,2</sup> This is based on an extensive qualitative literature indicating that an effective multi-disciplinary team can enhance decision-making, co-ordination of care, trust between

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professions, the well-being of team members and staff retention.<sup>3-9</sup> There is weak objective evidence that this can enhance service quality, and ultimately, patient outcomes and satisfaction with care.<sup>10-13</sup> Furthermore, in stroke services, multi-disciplinary team working is considered one of the mechanisms contributing to the superiority of specialist stroke care over generalist services.<sup>14</sup>

There have been many papers reporting models or frameworks to describe the features of effective teamwork, many of which are drawn from observations of team meetings.<sup>6,9,15,16</sup> Although presented in a variety of ways, they feature inputs to the team, group and individual processes by which the team operate and mediate the inputs, and outputs from the teamwork. The inputs involve the organisational context, team composition and aim of the team. The processes consist of actions and inter-team relations (defined as the team climate and interactions) while the outputs cover effectiveness, clinical outcomes and team members' well-being.<sup>6,9,15,16</sup> However, this literature tends to focus on the more generic issue of 'teamwork',<sup>8,9,15,17</sup> rather than the specifics of how teams operate. Thus we wished to explore how teams operated in day-to-day practice, with a view to develop interventions to improve their effectiveness, and ultimately patient outcomes. Regular meetings (usually weekly) to discuss patients' progress and plan treatment are the main process by which multi-disciplinary teams operate<sup>14</sup> but to the authors' knowledge they have not previously been specifically considered in stroke rehabilitation. Multi-disciplinary team meetings in cancer care (or tumour boards as they are also known) have been considered in detail.<sup>7,11</sup> This area of care has similarities with stroke rehabilitation in that they involve professionals sharing their knowledge to make collective, informed patient management decisions. However, they also have important differences in that they often focus on diagnosis and curative treatment rather than the minimisation of, and adaptation to, limited activity which is usually the focus of stroke rehabilitation. The core multi-disciplinary team also differs, involving a team of medical disciplines (physicians, oncologist, radiologist, surgeon, etc) rather

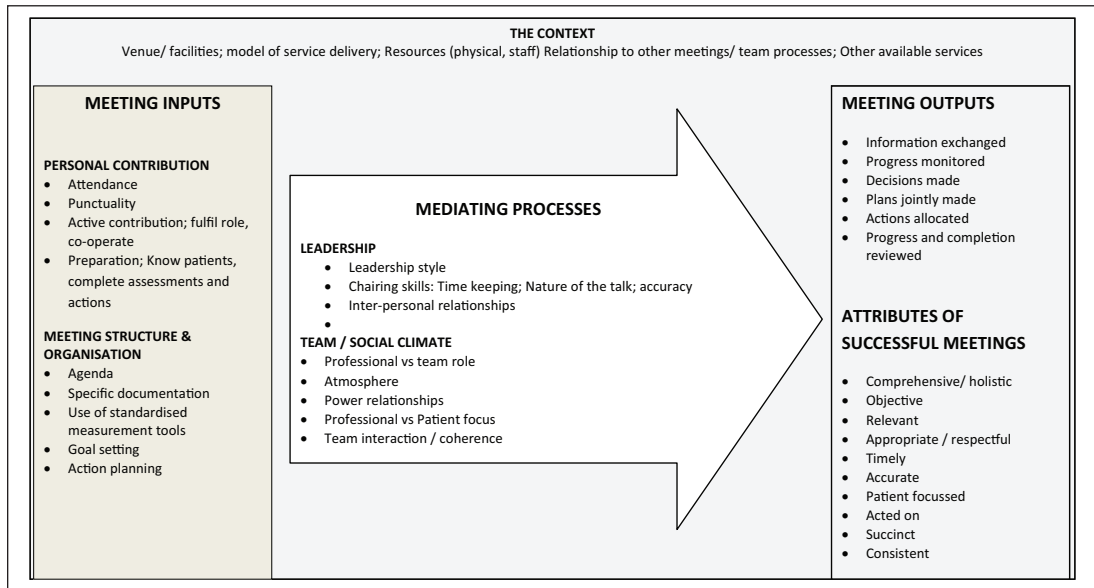
than different health professions; physicians, nurses and therapists in stroke rehabilitation. Reviews of the impact of multi-disciplinary team meetings in cancer care, have concluded that there was little empirical evidence to support (or refute) cancer multi-disciplinary team meetings, and where present the evidence was weak.<sup>7,11</sup> As might be expected, observational studies tended to show more positive results than other designs with less risk of bias.

To the authors' knowledge there have been no published data considering different ways in which multi-disciplinary team meetings operate (rather than whether they are beneficial or the teams' function) in stroke rehabilitation. This is the focus on the current paper. We wished to explore how teams operated in day-to-day practice, with a view to develop interventions to improve their effectiveness, and ultimately patient outcomes. Regular meetings (usually weekly) to discuss patients' progress and plan treatment are a key process by which multi-disciplinary teams operate and so these were the focus of this study.

## Method

As we sought an insight into how meetings operated, a qualitative approach was used. Non-participant observations of the weekly multi-disciplinary team meetings and semi-structured interviews with staff members were undertaken. Data were collected by one of the authors (LB) who was employed (by the university rather than the hospitals) full-time on a project to improve stroke rehabilitation services. As such she was known to the participating teams and worked with them closely but was not part of them.

All the hospital-based stroke rehabilitation teams in a large UK city ( $N=10$ ) were invited to take part in the observation study and the staff who regularly attended the team meetings were invited to be interviewed. At least one meeting with each participating team was audio-recorded, field notes were taken during the meetings and analytic memos made afterwards. A standardised form recorded details of the venue and availability of resources. At the first meeting at each site, the observer and



**Figure 1.** The conceptual framework for multi-disciplinary team meetings in stroke rehabilitation.

aims of the study were introduced and participating staff gave written consent to be recorded.

The local Research Ethics Committee was approached for approval; however they deemed it unnecessary as the study merely involved the observation of, and asking staff about usual practice. We obtained permission from the Chief Executive of each Trust participating in the project.

All staff who regularly attended the team meetings were invited to be interviewed and were selected to ensure that representatives from every site and all relevant professions were included. Interviews were conducted individually in a private ward office following the meetings and audio-recorded. A semi-structured interview topic guide covered staff's views of the team meetings; their purpose, effectiveness, barriers to success, how they could be improved and clarified details of the meetings, for example the information recorded in notebooks. Each interview lasted 30-60 minutes.

The audio-recordings were transcribed verbatim and anonymised for site and personal details. Data analysis was iterative using thematic content analysis with the input-process-output model as a

template.<sup>21</sup> Two of the authors (LB and ST) independently read the field notes and transcripts repeatedly for familiarity and to identify recurring ideas. They met regularly to reflect on the data, discuss their independent analyses and develop emerging themes. These were refined and used to populate the input-process-outputs model (Figure 1). The transcripts and notes were coded and then re-coded, sentence by sentence, against the elements of the model to ensure no important points had been missed. Any discrepancies in interpretation were considered and consensus reached. Relationships between items were explored and divergent opinions highlighted.

## Results

Eight of the city's ten rehabilitation teams participated. Two teams declined; one because they felt the data was too sensitive to be recorded and the other because they did not hold a regular multi-disciplinary team meeting. Twelve meetings were observed (at least one at each site). Eighteen staff were interviewed; one psychologist, one social worker; four nurses; four physiotherapists, four

occupational therapists, two speech and language therapists, one stroke co-ordinator and one stroke ward manager (Table 1). Unfortunately, we were unable to recruit any doctors to the interviews. All interviewees were women except one staff nurse and one physiotherapist. Four were junior grades (NHS Band 5); an occupational therapist, a physiotherapist and two staff nurses. Two were senior therapists (Band 6), one was a highly specialist therapist (Band 8), the others were in specialist posts (Band 7). The length of experience varied from a few months on the unit to over twenty years.

From our analyses a model of multi-disciplinary team meeting function emerged which conceptualised how the meetings were structured and the team operated during them (Figure 1). This has four elements:

- The overall context in which the meeting operated;
- inputs (personal attributes of the staff, and format and structure of the meetings);
- the processes which mediated the inputs (team climate and leadership/chairing);
- desired outputs; in terms of clinical decisions and the attributes of successful meetings identified by staff members.

Staff perceived that problems with the meetings (i.e. they were ineffective) arose when the desired outputs were not met or the positive attributes were not achieved, which was supported by the observations. Each of the elements are detailed below.

### The context

Weekly multi-disciplinary team meetings were established in all the observed stroke rehabilitation units and were considered a mainstay of the teams' function. Three sites also had a separate meeting to address patients' goals involving therapists +/- nurses. Two sites also held nurse-led daily ward meetings with the therapists to follow-up actions and note changes in patient care. Nevertheless, the service context in which the meetings operated were highly varied, which impacted on the teams decision-making, particularly discharge planning

(Table 1). In five sites, acute care and rehabilitation were combined and three were 'stand-alone' rehabilitation units. Community-based rehabilitation services were varied but were less than national guidelines recommend (detailed in Table 1).

Every site involved nurses, physiotherapists, occupational therapists and doctors. Half included a speech and language therapist and in two-thirds a social worker attended. Three sites had a psychologist or counsellor to cover emotional and cognitive problems, in the others this input was provided by the occupational therapist, or not at all. In three sites, the team was incomplete because of staff vacancies or a lack of funded posts, which staff felt inhibited the team's effectiveness and delayed discharge planning. Attendance was often incomplete because of sickness or annual leave, which was not covered by other members of the absent discipline. Three sites had arrangements where staff who were unable to attend provided information but when this did not occur, important information was unavailable which was observed to stymie planning, particularly for discharge. Several venues were unsatisfactory; using rooms with inadequate space, ventilation and/or privacy (detailed in Table 1).

### Inputs

**Personal attributes.** Most staff felt that meeting effectiveness was limited by the degree of staff engagement. For example, if members did not attend, prepare, contribute or were late.

*'There's an awful lot of waiting around for people, we don't start promptly. I think that's part of people's attitudes towards it, it's not seen as a priority'*  
[Physiotherapist, interview].

Team members at four sites were observed to know the patients well, have completed all assessments and have the necessary information to hand at the meeting using pre-prepared, detailed documentation. They were able to report progress on previous actions, decisions made, relevant interactions with the patient and family and problems arising. At the other four sites, preparation was less thorough; assessments were sometimes incomplete (even for

**Table 1.** Description of the participating stroke services.

Unit	1	2	3	4	5	6	7	8
Venue	Appropriately sized room off the ward. Could be hot and stuffy in warm weather. Small table in the centre and a desk with computer. Staff seated around the table in professional groups.	Large room off the ward. Team seated around large table with plenty of space for all.	Small cramped nurses' office on the ward with no door. Late-comers have to stand. Chairs and people have to move if someone or the notes trolleys entered or left the room, which delays the meeting. Computers, whiteboard and family meetings board available.	Rehabilitation kitchen/ staff room on the ward. Enough space for team members and notes. Calendar on the wall. Small table.	Appropriately sized room on the ward. Large table in the centre, whiteboards on wall. Ample space for team members and notes trolley.	Large seminar room off the ward with table in centre. Ample space for team members and notes which are spread out on the table.	Appropriately sized room on the ward, also used to store wheelchairs and some clutter. There was a small table with chairs around it. A desk with a computer and some printers were available.	Physiotherapy gym on the ward (if not being used to treat patients). Comprised an open space with chairs and table, otherwise a small, cramped nursing office was used with a table but insufficient space for chairs and all staff.
Staff attending	Senior doctor OT PT Stroke co-ordinator <b>Nurse</b> <b>Ward Manager</b> OT technician <b>Psychologist</b> (SLT and Social worker absent due to illness) N=8.	Senior doctor <b>OT x 2</b> PT x 2 Nurse Junior doctor N=7.	Senior doctor <b>OT</b> <b>PT</b> <b>Nurse</b> <b>Social Worker</b> Student PT Student OT (SLT absent as it doesn't fit with their timetable) N=5 (+2).	Senior doctor <b>OT</b> <b>PT</b> Nurse Social Worker Junior doctor Discharge co-ordinator Family support worker Student OT (No stroke-specialist SLT in post) N= 8+1.	Senior doctor <b>OT</b> PT <b>Nurse</b> <b>Speech therapist</b> Social Worker Student Occupational Therapist N=6+1.	Senior doctor <b>OT</b> PT Nurse/ Ward Manager <b>Speech therapist x 2</b> Social Worker Dietician Student PT N=7+1.	Senior doctor <b>PT</b> <b>Nurse</b> <b>Stroke co-ordinator</b> SLT Social Worker Junior doctor Discharge co-ordinator Community rehabilitation team member Student nurse x2 (OT absent due to low staffing levels) N=7+2.	Senior doctor <b>OT</b> <b>PT</b> Nurse Social Worker Junior doctor Discharge co-ordinator (Psychologist on annual leave) N=7.
Other stroke specific rehabilitation services available	Community neuro-rehabilitation team.	Early supported discharge team and community neuro-rehabilitation team.	Early supported discharge service, community stroke rehabilitation teams. Intermediate care with ring-fenced 'stroke' beds.	No stroke/neurology specific community services. Generic intermediate care widely used.	Community stroke team.	Community neuro-rehab team.	A combined early supported discharge service/community stroke/ neuro-rehabilitation team for patients living in some areas. No service in others.	Community stroke team.

Note: team members highlighted in bold indicates those interviewed. OT= occupational therapist; PT= physiotherapist; SLT = speech and language therapist.

patients who had been on the unit for some time) and supporting documentation absent. A further issue was that some staff stated they knew the patients insufficiently well to contribute; having just returned to work after annual leave, for example [Nurse, meeting transcript] or because therapists had not got around to seeing patients (observed in sites 6,7,8). This limited engagement led to frustration (reported in interviews and apparent during observations), as other members felt a greater responsibility to ensure the meeting ran effectively.

When engagement and attendance was a perceived problem, the teams tended to describe the purpose of the meetings in terms of exchange of information, or *'handover'* [Nurse, interview] between nurses and therapists and did not prepare information beforehand. They also tended to describe their involvement in professional terms, speaking from *'the nursing point of view'* [Nurse, interview] or a *'therapists' perspective'* [Therapist, interview]. Teams with greater engagement tended to describe the purpose in terms of the benefits of holistic input from all disciplines and supplemented discussion with formal documentation and a structured format which ensured that *'nothing was missed'* [Nurse, interview]. This also enabled people who could not attend to contribute and generated a mechanism to feedback to them.

### Structure and format of the meetings

The meeting format varied from the highly structured with a set format, standardised documentation, use of objective measurement tools, clear roles for each member and measures in place to feedback to other team members, to others where these attributes were not evident. Most teams used standardised measurement tools to some extent. The most frequent (three teams) was the Barthel Index to assess independence in the basic activities of daily living. When used, this was observed to provide a common structure and language for the discussion, which facilitated information sharing and joint decision-making. In other examples, uni-professional tools were used to report assessment of mood or cognition and the scores interpreted (to

some extent). Three sites did not refer to objective measurement tools at all.

The nature of *'the talk'* during the meetings was also highly varied and apparently related to the format of the meeting and the skills of the chairperson. Three sites had a structured meeting format for all patients based on standardised documentation. Consequently the reportage was often objective (*'he is transferring with one'* or *'she's dressing her top half now,'* for example) and comprehensive, covering activities of daily living, needs for discharge and previously reported problems. For two of these sites, the reportage focused primarily on sharing the patients' problems, their progress and plans. In the other, staff reported their professional activity and the patients' behaviour/ activity to the chairperson. In all of these structured meetings, the team kept to the point of the discussion, had the information needed to hand, there were no interruptions and little repetition or contradiction between members, who listened to each other respectfully.

The other sites were very different. Here, there was little discernible structure to the discussion; it was a *'free for all'* [Physiotherapist, interview]. After giving the patient's name (sometimes with a brief summary), team members would make comments in a fragmented and haphazard fashion. The language used to describe the patients was vague and subjective; *'she is doing very well'* or *'his balance isn't the best'* for example. It was not uncommon for information to be repeated but the detail inconsistent. Unlike the structured meetings, which focused on the patients' problems and what to do about them, the reportage tended to be profession-focused and included lengthy descriptions or anecdotes about the patients' activity or behaviour or staff's interaction with the patient. There were frequent, sudden changes of subject, repetitions and contradictions where the staff did not listen to each other and more than one conversation was taking place. Consequently, team members appeared to sometimes be unsure which patient was being discussed and issues were often left undecided. Conversation also often went off at an irrelevant tangent. For example, in one meeting there was a long discussion about cat welfare after it was

revealed that a patient was worried about her pet while she was in hospital. In one site, contradictions and frequent changes of subject between the chairperson (senior doctor) and other staff caused mismatches between reports about patients' problems, level of ability and the discharge plans being made.

## Mediating processes

In the interviews, staff highlighted that effective chairing was key to the success of the meeting, ensuring that discussion kept 'on track' [Nurse, interview] and was comprehensive. Ineffective chairing was reported and observed to lead to poor time management, failure to keep to the agenda and purpose of the meeting and lack of decision-making.

*'Sometimes it can be quite slow and sometimes we tend to go off on a bit of a tangent and discuss different topics. It completely depends who's there and who leads the meeting'* [Occupational therapist, interview]

*'It needs a stronger person in there to say 'right come on what is our decision?' Because you can spend ages talking about something but not actually make a decision'* [Physiotherapist, interview]

Usually the senior doctor (stroke consultant/physician) chaired, although sometimes there was no specific chair and the discussion was led by 'whoever has the notes' [Nurse, interview]. Different chairing and leadership styles were employed across the sites; the impact of which mediated the structure of the meeting, particularly the nature of 'the talk' and team members' engagement, positively or negatively.

In one site, the chair had a directive style, dominating the meeting and the team's actions. Conversation mainly involved reporting to him/her with little interaction between team members who appeared unwilling to contribute without the doctor's direction. However, the staff did not find this a problem, reporting in the interviews that they respected the doctor's leadership and felt the meetings worked well. In contrast, another site was

chaired in a more facilitatory style. Although clearly led by the senior doctor, contributions from all members and joint decision-making were facilitated while ensuring the discussion was comprehensive but effective and efficient (in that the desired outputs were achieved, see section on outputs for details). In a third site, the meeting was led and chaired collectively by the senior therapists, who took turns to lead the discussion for each patient. The staff were observed to be well-informed, the discussions comprehensive and the decision-making reasonably efficient. However one member was notably unengaged, spending much of the meeting interacting with his/her mobile phone, which the rest of the team ignored.

The other meetings were perceived, and observed, to be dysfunctional but for differing reasons. In one site, the chair used a laissez-faire style and lacked assertiveness, worrying about 'telling them [other team members] what to do' (Doctor, informal discussion outside the interview). In the other two sites, the senior doctors chaired more assertively but were disorganised. In one, the team were indulgent of this, teasing the doctor about their tendency to make decisions without consulting or telling others. In the other, the chair was working at odds with the team. They frequently pushed for immediate discharge despite the team's view to the contrary and appeared to be intent on finishing the meeting as soon as possible. Other team members were aware of this and complained in the interviews about how 'they [the doctors] want to get them [the patients] out before they can do anything' [Physiotherapist, interview]. In their interviews, other staff described how they worked together to counteract this attitude.

The team climate (defined as the interaction and atmosphere) mediated, and was mediated by, the inputs and the effectiveness of the chairing. As discussed above, staff reported that they valued and sought holistic input in a supportive environment with an effective chair. Most meetings operated in a positive climate; they were observed to be relaxed, friendly, respectful and co-operative with contributions from most members. However, in two sites, inter-professional relations were strained and, at times, openly hostile. The tension appeared



to relate to conflict between the lead therapists and senior doctors.

In one site, the long-established lead therapist appeared to withhold information from the discussion, for example by not sharing the results of an assessment; just saying *'don't worry it's all in hand'* when the chair (a newly appointed senior doctor) asked for details. We observed in these meetings that often members did not listen to each other and there were several conversations going on at once, which was disruptive. The situation was re-iterated in the interviews in which the therapists described the purpose of the meetings as *'to give information to the doctors'* and to *'force the doctors to make decisions'*, whereas the *'real work'* occurred in the goal setting meetings, which the doctors did not attend and the lead therapist chaired.

In the other site, there was no clear chair but the lead therapist fell, de facto, into this role which both s/he and the doctors appeared to resent. Some of the doctors' behaviour appeared obstructive; frequently changing the subject and *'going off at tangents'* in an apparent attempt to undermine the chair. They often pushed for patients to be discharged before the team felt they were ready and did not listen to other team members, forcing them to repeat themselves. The rest of the team found this very irritating, describing the meetings as *'like pulling teeth'* [Nurse], and the doctors as *'generally a disruptive influence [laughs]. And we'd kind of be quite happy if they didn't come'* [Physiotherapist, interview].

## Outputs

Staff generally felt the main outputs of the meetings were plans to guide the patients' treatment and discharge. For most, the aim of the meeting focused on the professionals involved; to *'review where everybody's up to with the patients, so making sure that all the things that need to, have been done'* [Physiotherapist, interview]. The meetings observed to be as an arena to exchange information and to plan treatment and discharge by identifying the patients' problems, monitoring progress and making joint decisions. This allowed resulting actions to be allocated to specific team members and, subsequently, for progress and completion of

the actions to be reviewed. Sharing information from all disciplines was felt to facilitate holistic input considering *'the whole person and their needs'* [Psychologist, interview] so that a comprehensive understanding of the patient was obtained. The opportunity for everyone to contribute was highly valued in that it was democratic; *'so it's not just one person talking at everyone and taking over'* [Physiotherapist, interview] and staff could learn from each other: *'There is a good input from them all... You learn things what you didn't know from each particular patient'* [Nurse, interview].

The meetings promoted communication as everyone was *'able to contribute relevant facts and information appropriately'* [Nurse, interview] and to *'talk things over and ask questions'* [Psychologist, interview] in a supportive environment, as one of the occupational therapists explained *'We all work together well ..... We all kind of know what's what. But if we've got some concerns, then other people take it on board'*.

Staff also identified features that contributed to the achievement of these aims. These were a clear structure, punctuality, efficient running, clear decision-making, and relevant discussion. For example *'I think it's got a good structure. The way that we have a set plan for each patient so we're going through actions'* [Physiotherapist, interview]. These features were absent or seldom observed in the meetings staff felt were ineffective and where their aims were often not met. We used staff's reports of the meeting aims, features and descriptors of desirable attributes of the meetings to define the outputs (detailed in Figure 1).

For some, there was a social element to the meetings. Staff often commented on how they *'got on well'*, even in the meetings which did not appear to run effectively. They described the meetings as *'the only time we all get together'* [Occupational therapist, interview] and to *'get everyone in the same place at the same time'* [Nurse, interview] from sometimes disparate locations with an opportunity to get to know each other. This built the team and members became committed to contribute: *'They [the team] aren't people from a distance; we don't get "well I don't know what's going on"* [Nurse, interview]. A sociable element was

important to achieve this *'I feel it's an opportunity, when the team come together, there should be some light-hearted banter'* [Occupational Therapist, interview].

The time involved was a challenge. Staff felt they needed to balance the workload demands for a quick, efficient meeting with the need for discussion to be flexible and 'patient-centred'. The meetings lasted 60-75 minutes (mean, 66 minutes) with an outlier value at 145 minutes. In this time, the team discussed between nine and 28 patients (mean, 15 patients) which allowed 3-7 minutes' discussion per patient (mean, 5.3 minutes per patient). This was observed to often be insufficient to take input from all disciplines and make joint decisions. Participants reported they felt torn between making time for the meeting (as it took them away from their other duties, particularly face to face contact with patients) and the need to cover all relevant information in sufficient detail to be fair to the patients:

*'You want to do the patients' justice, you don't want to just breeze through everything, you know and almost give lip service to the fact that, yes we've discussed them'* [Physiotherapist, interview].

This was a particular issue for nurses, who stressed that staffing levels did not accommodate the meeting.

*'I think, realistically, we shouldn't really be going over an hour, because obviously it's taking staff off the ward. Of course, it's important that we need to discuss the patients, but erm, staffing and leaving the ward short as well can be an issue'* [Nurse, interview].

## Discussion

To the authors' knowledge this is the first detailed examination of way stroke rehabilitation multi-disciplinary team meetings operate. It revealed highly varied practice from the structured, collaborative and functional to the dysfunctional, and featured differing styles of leadership and chairing. However, differences in the structure and format of the meetings were a consistent element. The meetings staff perceived (and were observed) to be

effective, in that their aims for the meeting were met, featured a set agenda, structured documentation; formal use of measurement tools; pre-meeting preparation and skilled chairing. These elements were missing in the meetings where the staff's aims were not met and which staff perceived to be ineffective. Other differences were the 'nature of the talk' during the discussions (detailed in the results section) and evidence of decision-making and co-operation between team members, which were apparent in the 'effective' meetings and tended to be infrequent in 'ineffective' ones.

The literature on team meetings is notable by its specific lack of observation of dysfunctional operation;<sup>9</sup> ineffectiveness is assumed to be the converse of observations of effective operation but has not been described in detail. Reviews of the characteristics and conditions for effective multi-disciplinary practice have concluded that organisational structure is a priority as it improves group processes.<sup>6,9,15</sup> They suggest that further research to improve operation could usefully focus on improving the structure and format of team meetings. We have identified the elements that are perceived to be features of successful meetings and work is ongoing to develop them in to an intervention and evaluate the impact of implementation.

Our findings regarding the leadership and chairing styles both contrast and concur with literature. In keeping with previous observations<sup>9,18</sup> we found examples of a facilitative leadership style and of collective, shared leadership where the teams achieved their aims (i.e. were considered effective) in an inter-disciplinary, positive environment. However, in contrast to theoretical texts,<sup>19,20</sup> the site with the most directive leadership style also appeared to meet effectively. The team followed a 'traditional' hierarchical multi-disciplinary model in which each discipline reported to the senior doctor who controlled the meetings, decision-making and planning. However, most aspects of patients' care were covered, clear decisions were made and the team climate was positive, with the team respecting the doctor's leadership. These differing, but apparently successful, styles downplay the importance of leadership style in effective team meetings and support our decision to focus on the

structure and format of meetings, and the chairing skills as 'mechanisms' to improve meeting operation.

Our data also illustrated the challenging demands that team members have to balance to contribute to multi-disciplinary team meetings. The need to manage time and workload efficiently by minimising duration contrasted with the reported need for time to consider each patient comprehensively and build inter-team relationships. Contributing to inter-disciplinary care also sometimes conflicted with professional identity and role. Finally team members' view that a patient would benefit from further inpatient rehabilitation (especially as community-based rehabilitation was often not available) often conflicted with the financial pressure to minimise hospitalisation. Multi-disciplinary team working is often described as complex and these challenges illustrate the multiplicity and magnitude of that complexity. The ineffective team meetings were defined by the absence of several key team characteristics which are thought to promote cohesion and co-operation; a shared purpose for the meetings; clearly delineated roles; team members' engagement; skilled leadership and chairing; formal structures and appropriate resources.<sup>6,9,15</sup> Despite the extensive literature observing the importance of these features, work to develop effective ways to operationalize them and evaluate their impact on team operation and, ultimately, outcomes is currently lacking.

Our findings have clear implications to improve clinical practice but several limitations need to be considered. Although we attempted to engage all professionals of the core multi-disciplinary team, we were unable to engage any doctors in the interviews which may indicate that this aspect of their role had a low priority (or simply that they had other more pressing demands on their time).

Generalizability is limited. We involved the stroke rehabilitation units in one of the largest cities in the UK and our findings resonant with previous publications so we feel they are reasonably representative, but results from other health care systems and models of rehabilitation may differ. Finally we only observed multi-disciplinary team meetings, which are not the only time that teams

interact and teamwork is undertaken. Most teams held other meetings for goal-setting, to discuss future care with patients' families or to update day-to-day progress. There are also many informal interactions and discussions outside formal meetings; this project has not captured these. However we feel this is reasonable as it is in the multi-disciplinary team meetings that decisions are formally made, actions agreed and progress monitored.

We also only sought to consider the operation of the meetings, thus conclusions about the effectiveness and outputs of the team as a whole cannot be drawn.

### Clinical messages

- Multi-disciplinary team meetings are complex and require staff to balance competing demands to contribute to patient-centred rehabilitation and to the team while managing time and workload efficiently.
- Multi-disciplinary team meetings are highly varied in terms of format, leadership style and team climate, as is their effectiveness.
- A set agenda, structured documentation; formal use of measurement tools, pre-meeting preparation and skilled chairing are key features of effective meetings.

### Conflict of interest

The authors declare that there is no conflict of interest.

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