Group assessment of residents' clinical skills using Case-based Discussions is feasible, highly valued and moreover fosters learning

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Abstract

Background Assessment of residents' clinical skills using Case-based Discussion traditionally involves a one-to-one discussion with a supervisor. This entails a subjective, and maybe unequal, assessment of the resident, which can only be overcome with the use of multiple assessors. The purpose of this study was to explore residents' and assessors' perception of a group-assessment concept.

Methods Eleven to fifteen residents in a medical department met 4 times (every 3rd month) over 1 year for 5 hours each time. The residents took turns presenting clinical cases within a predefined topic and discussed it with peers and assessors (diagnosis, differential diagnosis, ethical considerations etc.). Four assessors (specialists in internal medicine) participated in the discussion and together assessed the residents` clinical skills. An external consultant observed the group-assessment several times and conducted semi-structured interviews with the residents as well as the assessors. Notes from the observations and transcribed interviews were analyzed using an inductive approach looking for participants' perceptions of the concept.

Results Both residents and assessors preferred the group-assessment to the individual assessment. Since there were several assessors, the group-assessments were more consistent and regarded more resource-efficient and manageable than one-to-one assessments. The level of discussion was perceived to be higher in the group discussions compared to one-to-one discussions. All residents gained new knowledge during their assessment and in addition, also reported having learned from listening to the assessment of their peers. Assessors reported gaining new knowledge as well.

Conclusions Group-assessment through Case-based Discussions is a good way to structure assessment of residents` clinical skills. The quality of the assessment process seems to be increased and is likely to be more objective than individual assessment. Group-assessment is feasible and acceptable, and additionally fosters learning for all participating doctors in the department.

Background

Along with the implementation of competency-based education, workplace based assessment (WPBA) has been widely adopted (1, 2). Although the validity and reliability of WPBA methods has been disputed, evidence for their utility seems well established for a number of assessment methods including Case-based Discussions (CbD) (1, 3–5). To enhance the efficacy of WPBAs, multiple factors should be taken into account.

The assessment should focus on competencies that are central to the activity being assessed, and the assessors who are best-placed to judge performance should be asked to do the assessments (6). To enhance learning, it is critical that provided feedback is consistent with the needs of the learner and focus on important aspects of the performance (while avoiding personal issues) (1, 4, 7). The reliability of WPBAs improves by increasing both the number of assessments and the number of assessors involved (1, 6, 8). The factors that enhance the utility and efficacy of WPBAs, have likewise been reported in

relation to the use of CbDs (3–5, 8). Furthermore it is suggested that the educational value and content of CbDs could be improved by providing ring-fenced time for these in both specialists' and residents' job plans, in order to provide sufficient time for teaching and learning (4, 8–10).

A fairly new study exploring how CbDs were perceived by a UK cohort of medical trainees, demonstrated that most trainees appreciate the educational value of CbDs (11). However, more emphasis on planning these assessments is required and also on providing feedback that is both specific and actionable (11). Similar conclusions has been made from other studies (4, 10).

Based on knowledge regarding the requirements for successful performance of WPBAs and in particular CbDs, the idea for a new group-assessment concept took shape. The purpose of the group-assessment concept was to increase the quality of CbDs used for assessment of residents` clinical skills and to make sure that the assessments were performed in an operational manner, that could perhaps also be time and cost efficient.

In a medical department, the mandatory assessments through one-to-one CbDs were therefore experimentally replaced with group assessments.

Methods

The aim of this study was to evaluate the group-assessment concept and to explore the residents and $assess$ or s perception of the concept.

Setting of the study

In Denmark, where the study took place, outcome-based education with mandatory WPBA, based on the seven CanMEDS roles was implemented in 2004. In order to become a specialist, the physician must go through a 2-year internship followed by four or five years of specialty training. All residents have an educational supervisor appointed for each rotation, who is responsible for the resident's educational program in that particular rotation. However, all specialists in a department are obliged to act as clinical supervisors in daily clinical practice, and may act as assessors of clinical skills.

This study took place in a large multidisciplinary medical department. Specialties represented are cardiology, endocrinology, rheumatology, gastroenterology, and pulmonology.

Study design

This study was based on observations of the group assessment sessions. All the residents and specialists, who participated in the sessions, were later invited for an interview (by a first come first served principle). Recruitment for interviews stopped when saturation of data was achieved. Six residents and four assessors were interviewed.

Set-up

The group-assessments were held every 3rd month during a year, where every session was scheduled to last 5 hours. Participation in the group-assessments was mandatory for residents and scheduled in the doctors' job plans.

The schedule for the group-assessments was send out a year in advance and three months before every meeting, the residents were reminded about the 3-4 predefined topics of the next session. The assessment group, who were medical specialists within the topic for the next session, were also invited to participate (Table 1).

Table 1. Topics discussed every 3rd month with participation of residents and selected assessment group specialists

Internal Medicine Group-assessment	Topics for Case-based Discussions	Assessment Group. Specialists in:
March	Chest pain Dyspnea Edema The shocked patient	Cardiology Pulmonology Internal medicine Internal medicine
June	Fever Weight loss Musculoskeletal pain Blood disorders	Infectious diseases Gastroenterology Rheumatology Haematology
October	Stomach pain, diarrhea and obstipation Water-electrolyte and acid-base imbalances	Gastroenterology Endocrinology Nephrology Internal medicine
December	Dizziness and falls Terminal illness Poisoning	Geriatrics Endocrinology Cardiology Internal medicine

All residents at the medical department participated (eleven to fifteen residents each time). The residents were all five years or less from becoming medical specialists in rheumatology, endocrinology, cardiology, gastroenterology or pulmonology. Four assessors and a moderator who were all medical specialists also participated in each group-assessment. Author HS served as moderator at all meetings/sessions.

Data collection

An external consultant (an anthropologist) observed the group-assessment three times (figure 1). The observations included observation of the structure and process, number of cases, the number of questions and comments, the placement of the participants, mutual conversations, use of mobile phones/ipads, length of breaks and so on. Field notes were taken.

Development of interview guide

From observation of the first group-assessment, the anthropologist developed an interview guide [see Additional file 1].

Interviews

Thirty minutes semi-structured interviews using the interview guide were carried out. The interviews included topics such as experience with and attitude towards group assessment, comparison/experience with on-to-one assessment, structure of the group-assessment, preparation, outcome, case presentation and more.

Analysis

All the interviews and field notes were transcribed verbatim. The data material was thematically categorized (13) according to the interview guide by the author RBN, who read the material and identified main themes and sub-themes. The categorization, themes and sub-themes were discussed with author HS until consensus was reached. Qualitative guidelines were followed to ensure transparency (14,15). Quotations that most accurately illustrated the sub-themes were selected and translated from Danish into English. Quotations are anonymized using pseudonyms. Table 2 shows the themes and sub-themes with examples of statements belonging to the themes.

Table 2. Interview themes and quotations

Theme	Residents	Assessors
Overall perception of group assessment	"I think it is a much better idea than the way it works other places. We have to have these signatures...." (resident 4) "I think it is a very big relief to have your competences approved in this manner, because the other way [one-to-one assessment] is chaotic and random." (resident 6)	"After participation I felt very positive about the concept. I really think it was very rewarding in many ways. It was definitely something that gave new dimensions that I have not experienced in other places..." (assessor 1)
Group assessment versus one-to-one assessment	"There are advantages and disadvantages related to both types of assessment, but I think I would personally benefit most from the one-to-one assessment. There is nothing bad to say about the group assessment. I think [group-assessment] is a good way to have your competences approved." (resident 2) "It is academically very enriching that many fields of medicine are gathered. We come together and discuss which is the opposite of what my fellow residents will experience other places. I have earlier participated in one-to-one assessments where you just meet with your supervisor and look at a couple of medical records and then the supervisor says; "It looks good" and then there is no more discussion. .....So, I would definitely say that it is worthwhile to use 5 hours 4 times a year on group-assessments where there are many who provide me with feedback." (resident 4)	"The one-to-one assessments are very shallow. It is something like; "Well, this looks good. Do you have any comments?" and "We have to have this signed". There was very little content in the one-to-one assessment and it was done because we had to, and not in order to achieve anything." (assessor 1)
Outcome regarding learning, motivation and attitude	"Well, the good thing is that we come from different fields of medicine, and the value of this is, that if you for instance present a case with a rheumatologic disease, then it is exciting to hear what the doctors in the field of rheumatology have to say about the case." (resident 5) "I look at it as a good opportunity to discuss common challenges. I mean certain types of patients and illnesses. So, I see it more as an opportunity for discussion, than an assessment of my competences." (resident 4)	"....I am for instance a specialist in gastroenterology and I am a supervisor for a resident, but I also have to approve competences that are outside the field I normally deal with." (assessor 3) "I think it works well; you get around a lot of topics during the group-assessment...." (assessor 3)
Context and structure regarding preparation, time used, case presentation and the moderator	"The group-assessments are announced a long time ahead of time. You know what the topics are so you pay attention to them in your daily clinical work, if you encounter something exciting. So, you want to find a case with substance that you think is interesting for your colleagues to hear about." (resident 5) "I think the length of the session was very suitable. You can feel a bit tired in the end, but I don`t think it is a problem. I have tried to attend something in just five minutes where I have been more tired. It is after all a matter of how interesting it is." (resident 4) "There has been a tendency to pick good and exciting cases. However, in our field we could be better at presenting what is difficult or unclear, because that is what we often encounter in the daily clinical work..."	"The second time I participated, it worked out really well. ..... The residents all came well prepared and we did too. Everyone was set on getting a really good discussion of the cases." (assessor 2) "I have been very positively surprised of how well prepared the residents have been, also in regard to background knowledge..." (assessor 4)

	(resident 1) “The cases that are to be presented, are cases that were challenging and difficult. ..... It has to be a case where you were challenged while on night shift or at the ward round or something else, where you had a hard time solving the problem, and then you can present this issue.” (resident 2) “The moderator makes sure that everyone gets to present and contribute to the discussion, and this assures that everyone is well-prepared for the session.” (resident 4)	“We talked a lot about how important it is to have someone to steer the meeting and that the moderator makes sure that everyone has contributed to the discussion, or when it is necessary to confront some of the residents who have been less active in the discussion.” (assessor 4) “I think the whole concept depends on a really good moderator who can steer the meeting and make sure that the purpose of the group-assessment is met, which is that all residents get their competences approved.” (assessor 4)
Relation	“When you come to a new department and join the group-assessment then it is also a good place for social networking, because you have five hours together.... you are in dialogue with the others and feel safe.” (resident 1)	

Results

Observations of the group-assessment by the external consultant are presented, followed by interview data, split into relevant sub-themes.

Observation of the group-assessment

On the day of the group-assessment, each resident took turns presenting a clinical case within each of the day’s topics (approximately 1 hour discussion for each topic). PowerPoint were not used, but patient data, such as blood samples (from the electronic journal), was sometimes presented on screen.

The cases were discussed with both peers and the assessors. The moderator kept track of time and made sure that all residents participated in the group discussion and the presentation of cases. The four assessors and the moderator together assessed the residents` skills and feedback was given during the discussion of the case. Notes and mandatory standard assessment forms were used for the assessment [see Additional file 2].

The external consultant was in no position to evaluate the medical content of the discussion, but it was evident that a case could result in discussion of many aspects such as social background, ethics, and collaboration besides core medical content. This generated numerous inputs from both residents and assessors. Many of the cases presented were known by many of the gathered doctors, increasing the possibility of viewing the case from different perspectives. There was a great variation in the number of

doctors who took part in the discussion after each case presentation, and also a great variation in the amount of time used on each case discussion (from 2 to 20 minutes). There was also a great variety in how active the assessors were, especially in regards to follow-up questions for assessment of satisfactory clinical competences of the resident, suggesting different understanding of the role as an assessor, which was also confirmed during the interviews.

During the CbDs it was noticed that the moderator played a powerful role in assuring that all topics were discussed and that all residents participated in the case presentations and following discussions.

After each topic, the assessors and moderator, in privacy, discussed the performance of the residents, and came to a consensus on whether the competence should be approved. If a resident did not perform sufficiently, a one-to-one assessment together with the educational supervisor would be arranged. The results of the assessment were communicated to both the resident and the educational supervisor at a later time in order to avoid humiliating the resident in a group forum.

Interviews

Preparing for the group-assessment and case presentation

As the topics and dates for the group-assessments were send out a year in advance, with a reminder three month prior to the next group-assessment, the residents felt that they had plenty of time to gather and prepare cases;

"You know what the topics are, so you pay attention if you encounter an interesting patient. You want to find a case with many interesting aspects that you think will be of interest to all your colleagues." (resident 5)

The residents remembered the cases by making notes about them and by reading the notes again directly before the group-assessment.

The assessors were a bit nervous about what to expect prior to the first group-assessment, but found there was no need for preparation;

"The first time I was unsure about what to expect, but I think it went well… I found out that I knew the things I should know, and it did not require any great preparation." (assessor 3)

The residents` themselves picked out the cases they wanted to present. Therefore, as some pointed out, there could be a tendency to pick out cases where they felt confident of own knowledge. Several residents stated that there might be a tendency to pick out cases that were rare and intriguing; "*There has been a tendency to pick good and exciting cases. However, in our field we could be better at presenting what is difficult or unclear, because that is what we often encounter in the daily clinical work…..*" (resident 1)

Other residents, on the contrary, stated that they were more likely to present difficult cases where they had been in doubt of what to do. Yet another resident stated that she chose to present a case within her own

specialty that she thought it **was** important for all doctors to have a minimum of knowledge about.

Assessment, resources, and approval of competences

A repeated statement was that it could be difficult to assess all the residents at the same time. One might hide in a group, not necessarily because he/she did not have the required competences. This could be due to personality, as some are more introvert and timid/reserved, while others are extrovert and like to be heard;

"*You are in a forum, where one might feel a bit exposed. You are together with specialists from the department, and everybody has that basic fear. One would not want to present oneself as professionally ignorant."* (resident 1) Many doctors acknowledged the ability of the moderator to steer the meeting, and in making sure everyone was heard. The length of the group-assessment was regarded as suitable and many emphasized that the meetings were relaxed with a good and safe environment, which was not exam-like. Since there were several assessors, many thought that the assessment was more consistent.

All though it took time to plan the group-assessments, both the residents and assessors felt that they were more resource-efficient and manageable than the one-to-one assessments.

As the meetings were scheduled during working hours it was highly appreciated that the group-assessment concept made it simple and straightforward to have the competences approved. A resident pointed out that formerly having competences approved often became a hunt for signatures, often without proper assessment and feedback;

"*I think this is a much better idea, than the way it works in other places. We have to have these signatures, there is a terrible lot of signatures…So it is a bit of a hunt for signatures, without anyone really going into the depth with the different things."* (resident 4)

Professionalism, learning and interdisciplinarity

The residents especially appreciated the professional discussions in an interdisciplinary environment. It was found to be professionally enriching and educational to meet with doctors from other specialties to discuss relevant common relevant challenges. It was also mentioned by the residents that the group-assessments gave an insight into of the other doctors` skills, which could be used as an inspiration to become just as skilled;

"You get a better insight into the other doctors skills, and this may be used as an inspiration to become just as skilled as the others." (resident 5)

For the assessors, the assessment process had a greater focus than the professional discussions, but they also acknowledged that all doctors gained more knowledge from the group-assessments compared to the one-to-one assessments. The extra time to discuss cases was highly appreciated. As one assessor put it;

“…. I think we all felt it was a luxury to have the time for discussion. Because we all learn from each other, no matter if you are a resident or an expert. But the expert is not an expert in all fields of medicine, so in that way it is of mutually benefit, although the assessment is about them [the residents]. In that way I think they get a wider knowledge compared to the one-to-one assessments.” (assessor 2)

Both residents and assessors thought that the group-assessments were rewarding for all. Most participants looked forward to the next group-assessment, because they gained new knowledge and insight during the meetings. The group-assessments made it possible to discuss more cases (around 24 cases in a session) compared to the number of cases covered at the one-to-one assessments (usually three to four cases). Furthermore, the presence of both residents and assessors from different specialties provided more perspectives and interdisciplinary knowledge. One resident thought the concept was a stroke of genius;

”The fundamental idea to meet four times a year and have the competences assessed in a forum where residents and specialists are gathered, is a stroke of genius. Because it shows that this is something that needs to be done, and there is a setting and a deadline for the assessment.” (resident 1)

Overall perspective of the group-assessment concept

Eight out of the ten doctors who were interviewed, preferred the group-assessment concept prior to the one-to-one CbDs, while two residents preferred the individual one-to-one assessments, given that there was enough time for the case discussion;

“*I think I would personally benefit most from the one-to-one assessment. But it [group-asssessment] is a good way to have your competences assessed.*” (resident 2)

The residents acknowledged the value of individual supervision with their educational supervisor, but for the approval of core internal medicine competences, the group-assessment concept was found superior by most.

Many of the doctors therefore suggested that the group-assessment concept should be tried out and subsequently maybe implemented at other departments, as a replacement for mandatory one-to-one CbD assessments of key competences.

Discussion

By creating a group-assessment concept it seems that many of the obstacles associated with one-to-one CbDs for assessment of clinical competences can be eliminated. The group-assessment concept provides ringfenced time for the assessment process and by including many assessors, subjectivity and bias in the assessment process is likely to be reduced. Furthermore, the gathering of assessors and residents from different specialties, raises the level of discussion, and both residents and assessors find that the additional learning process in the assessment is improved.

Dedicating 4 × 5 hours for group assessment with the gathering of many of the doctors in the department, may seem like an unaffordable solution. It requires planning ahead of time to make sure the residents have the time to find cases, but also to make sure that the residents and specialists are not scheduled to other tasks. This definitely requires an open-minded head of the department, willing to invest the time on education. However, the investment seems to be worthwhile since both residents and specialists in the department report increased learning when using this new concept in assessment. Thus, the introduction and implementation of this group-assessment concept is an example of how complex changes in health care succeed if you accept local solutions. Very recently, Dagnone et al (16) called for more freedom in the interpretation and implementation of competency-based medical education to make it fit locally. The group-assessment concept presented here might be an inspiration to other departments and countries.

By participation of multiple assessors in the group-assessments, the risk of bias is likely to be reduced, due to the reduced influence of personal relations (17). Furthermore, assessors from different fields of internal medicine, emphasize different aspects of cases. For instance, the emphasis may be quite different when it comes to a discussion of “dizziness”, whether you are a cardiologist or a geriatrician. A broader view of the cases and the required competences is therefore gained.

The assessors understood their role as assessors differently, and perhaps the use of assessors who were already familiar with the concept, could further improve the group-assessment (18). However, the mutual discussions among the assessors regarding whether or not a resident had the necessary competence to get approval in it-self contributed to the assessors knowledge and skills as assessors and lead to a common understanding of the concept of CbD, and how it is to be used in this specific department. The need to be trained as an assessor has been recommended by several authors (19–21). The introduction of this group-assessment concept thus provided a learning opportunity for the assessors regarding the use of CbD. Whether this led to an increase in the quality of other assessments in the department was beyond the scope of this study. However, the general agreement on pass/fail level obtained through the discussions among the assessors does lead to a higher uniformity and probably makes the assessments more fair.

The residents themselves chose the cases that they wanted to present at the group-assessment. Therefore, as pointed out by the residents, they might present cases, where they had performed well, and therefore the CbDs might not alone give a reliable picture of the residents competences.

One of the difficulties reported by the assessors was the variation in the residents’ contribution to the discussion, which might lead to the more introvert residents being overlooked. All assessors stressed the important role of the moderator in making sure all residents were active. Besides this, the moderator should be able to steer the conversation and ensure group effectiveness. These are all competences ascribed to a good facilitator (22). In the opinion of the assessors the moderator plays a crucial role for the success of the concept.

To our knowledge similar studies regarding group-assessment of residents` clinical skills has not been made, but the concept may resemble practice-based small group learning (PBSGL) where groups of

doctors gather to discuss cases from daily clinical work, and where case presentations are often followed by topic review and discussion of the related evidence-based medicine articles to identify implications for practice changes (23). The concept is widely used by general practitioners and seems to be a promising method of continuing professional development (23). In this study it was found that the group-assessment concept provided an increased learning experience for both residents and assessors and perhaps similarly also contributed to a continued professional development of the assessors.

Limitations

A limitation to the study was that residents and assessors volunteered for the interview, and therefore doctors who were either very fond of or dissatisfied with the group-assessment, might be more likely to volunteer. This might have given either more positive or more negative results. However, in the interviews both positive and negative evaluations of the concept appeared. Thus the results seem to reflect reality.

Another limitation is that only one of the authors of this paper performed the data analysis. However, the categories and themes were discussed and agreed upon by two of the authors (HS, RBN), who also attended all the group-assessment sessions.

Furthermore, it is difficult to consider the generalizability of the results from this study, since only one department participated. It might not be possible to implement group-assessment in all departments or in all specialties. However, most specialties have general competences and many specialties use CbD in their assessment program, therefore it might be interesting to try out the concept in other specialties and departments.

Conclusion

The group-assessment concept offers an acceptable, feasible and efficient model for CbD used as a formative assessment of residents´ competences in internal medicine. It reduces the effect of interpersonal issues between resident and supervisor and thereby minimizing bias. It provides the busy clinicians with protected time to engage in teaching/assessment activities. The amount of knowledge, skills, input and inspiration grows with the number of residents and medical specialists. Thus, group-assessment serves as a tool to assess clinical skills, but also provides learning for all the participating doctors in the department.

The group-assessment concept with the goal of assessment of residents` competences, alongside mutual learning, could serve as an inspiration for other departments and specialties.

Abbreviations

CbD: Case-based Discussion

WPBA: Workplace based assessment

PBSGL: practice-based small group learning

Declarations

Ethics approval and consent to participate

The study did not need formal ethics approval according to Danish law (Act on Research Ethics Review of Health Research Projects) (12). However, all residents and specialists who volunteered to be interviewed, received oral information about the study and gave verbal consent to participate, which is also in agreement with national guidelines (12) . Anonymity was guaranteed, including citations, and only the consultant had access to interview data.

Consent for publication

Not applicable.

Availability of data and materials

Not all datasets of the current study are publicly available since participants were guaranteed that only the consultant read the transcriptions from the interviews. Data could be made available in an anonymized form through the corresponding author on reasonable request, however all data are in Danish.

Competing interests

The authors declare that they have no competing interests"

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Authors’ contributions

RFJ took part in the group-assessment sessions and was the major contributor in writing the manuscript. RBN was the external consultant and observer of the group-assessments and conducted all interviews and analyzed and interpreted the data. BM contributed with expert guidance and was a major contributor in writing the manuscript. HS developed the study protocol and served as moderator of the group-assessment sessions. All authors contributed to the writing of the manuscript and read and approved the final manuscript."

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Figures

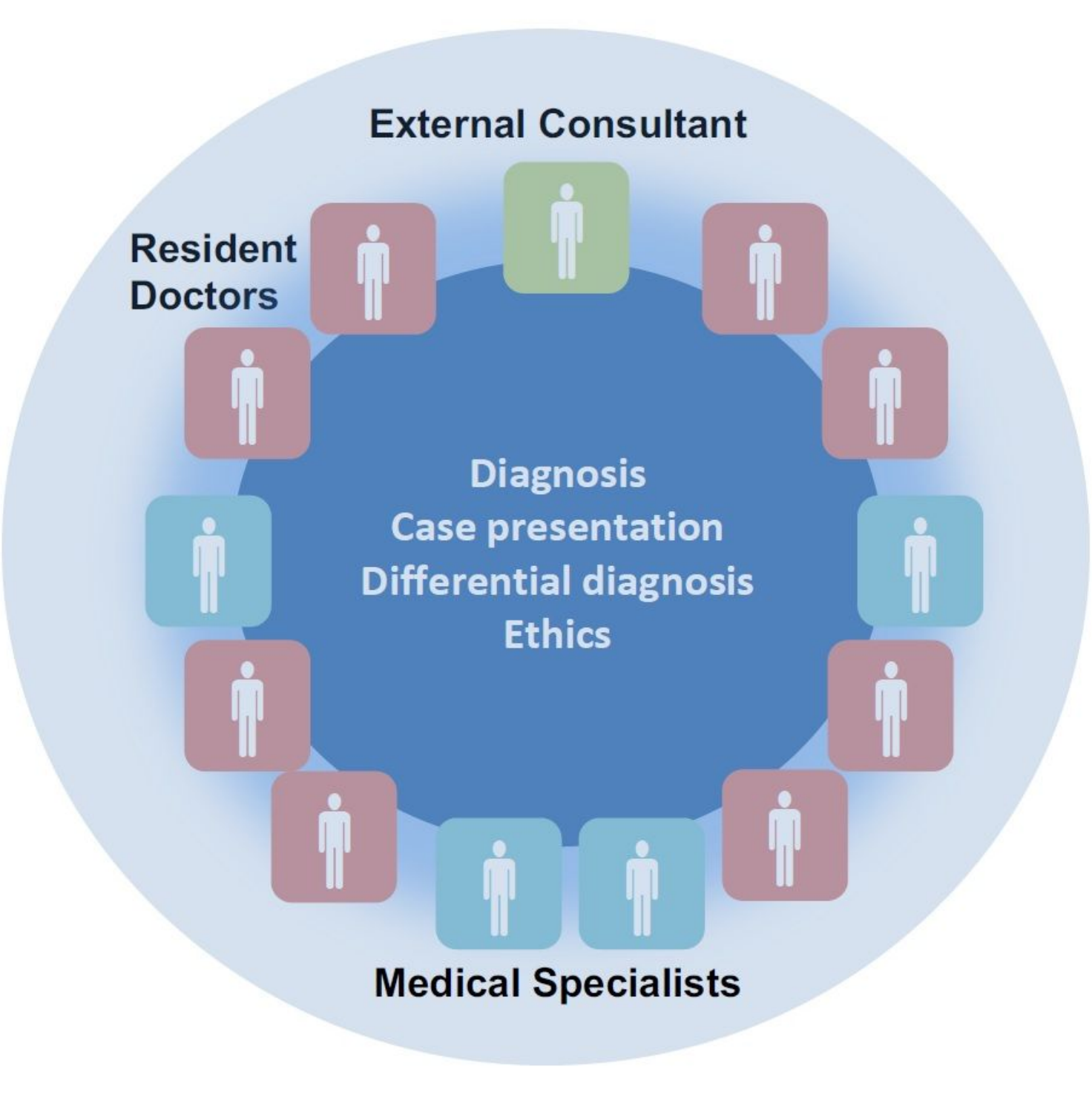

Figure 1

Case-based group-assessment 4 x 5 hours per year with participation of residents, assessors (medical specialists) and an external consultant as an observer of the concept.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Additionalfile2.pdf
- Additionalfile1.pdf