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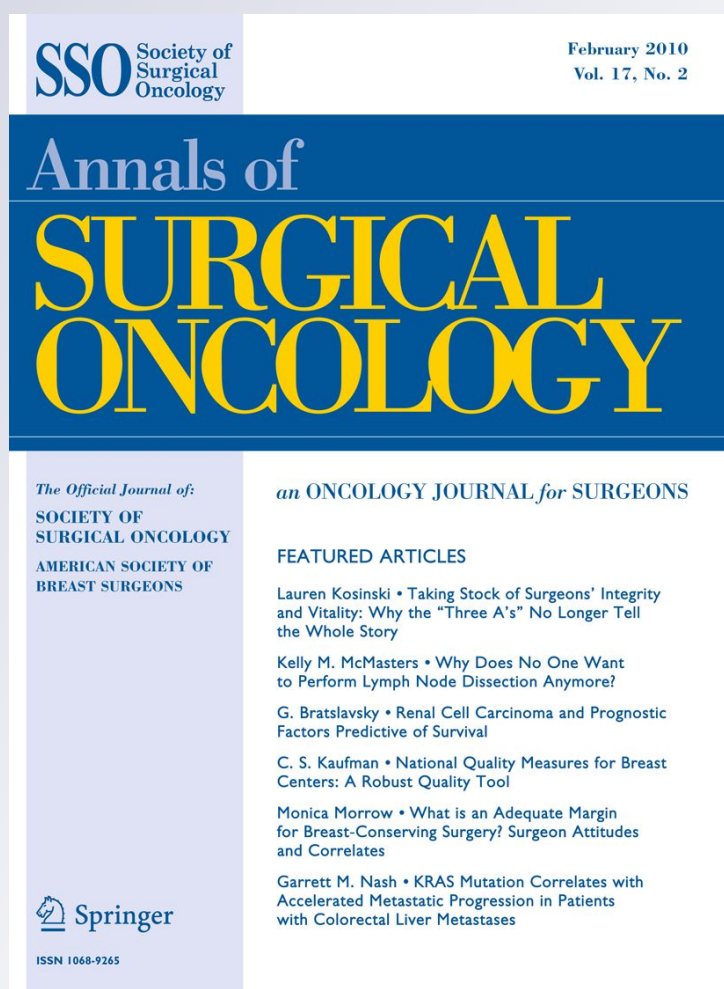
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Development and Evaluation of a Checklist to Support Decision Making in Cancer Multidisciplinary Team Meetings: MDT-QuIC

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ABSTRACT

Background. The quality of decision-making in cancer multidisciplinary team (MDT) meetings is variable, which can result in suboptimal clinical decision making. We developed MDT-QuIC, an evidence-based tool to support clinical decision making by MDTs, which was evaluated by key users.

Methods. Following a literature review, factors important for high-quality clinical decision making were listed and then converted into a preliminary checklist by clinical and safety experts. Attitudes of MDT members toward the tool were evaluated via an online survey, before adjustments were made giving rise to a final version: MDT-QuIC.

Results. The checklist was evaluated by 175 MDT members (surgeons = 38, oncologists = 40, specialist nurses = 62, and MDT coordinators = 35). Attitudes toward the checklist were generally positive ($P < 0.001$, 1-sample t test), although nurses were more positive than other groups regarding whether the checklist would improve their contribution in MDT meetings ($P < 0.001$, Mann–Whitney U test). Participants thought that the checklist could be used to prepare cases for MDT meetings, to structure and guide case discussions, or as a record of MDT discussion. Regarding who could use the checklist, 70% thought it should be used by the MDT chair, 54% by the MDT coordinator, and 38% thought all MDT members should use it.

Conclusion. We have developed and validated an evidence-based tool to support the quality of MDT decision making. MDT members were positive about the checklist and felt it may help to structure discussion, improve inclusivity, and patient centeredness. Further research is needed to assess its effect on patient care and outcomes.

In recent years an increasing awareness of the occurrence of medical error has led to a drive to improve the quality and safety of healthcare through improvements to technology, policy, and practice.^{1–4} Much of the work to improve safety and quality has arisen in acute specialties where successful quality improvement programs have included improving communication in the OR, reducing length of stay and infection rates in critical care units, and reducing complications in surgery.^{5–8}

Improving the effectiveness of cancer multidisciplinary care teams (MDTs) has recently been featured on the quality improvement agenda.⁹ Such teams involve surgeons, oncologists, radiologists, pathologists, nurses, and administrators (MDT coordinators) who work together to diagnose and treat patients with cancer.¹⁰ In the UK, MDTs were introduced to standardize cancer care by ensuring that patients receive appropriate and timely care by skilled professionals.¹¹ MDTs can be effective by promoting teamwork, consensual decision making, and adherence to clinical practice guidelines.^{9,12,13} The focus of clinical decision making is the weekly MDT meeting, which is attended by all team members. Research shows, however, that the performance of these teams can be variable, often lacking a focus on the patient.^{9,14–16} Poor teamwork and the failure to consider comprehensive information when making decisions can impede decision making and may result in decisions that are clinically inappropriate, or unacceptable to patients, which are not then implemented.^{17,18}

Our own research has demonstrated that there is currently no standardized method of conducting MDT meetings, and case discussions can be rapid, highly pressured, and unstructured.^{16,19} The average length of time of case discussion was 3 min, and input from nurses was lacking.^{16,19} In addition, information on patients' views, psychosocial aspects of care, and patients' comorbidities was consistently under considered in clinical decision making.^{16,20}

In the light of this evidence, it is conceivable that standardizing the discussion process might improve the overall quality of clinical decision making for cancer patients by ensuring minimum quality requirements for information presentation and participation of team members. One means of standardizing processes and improving quality that has been successfully used across a number of industries is the checklist.²¹ Checklists are inexpensive tools that can be used in complex, high-intensity fields of work to improve safety and accuracy of service delivery by reducing human error.²² Checklists vary from the prescriptive (the algorithm for CPR), to those that are just a mnemonic list (an equipment list for a procedure), leaving the method of implementation to the clinician.^{23,24} They can be used as guidance during a task, or for post hoc verification that certain tasks have already been performed.²² There are limitations to the utility of checklists—they can be difficult to enforce and may be perceived to undermine autonomy, skill, or knowledge.²¹ In addition, organizations can suffer from checklist fatigue, where the increasing number of checklists becomes a nuisance, rather than a benefit.²¹ However, strong evidence now exists that demonstrates robust improvements in healthcare processes and outcomes where checklists are used, including in critical care units to reduce infections and length of stay, in anesthetics to reduce communication error, and recently by the WHO to improve safety in surgery.⁵⁻⁸

In order to overcome such barriers to implementation a checklist must be developed in a robust manner.^{22,23} The aim of the research reported here is to develop an intervention to standardize and improve the quality of case discussion and clinical decision making in MDT meetings. Our specific objectives are: (1) to develop an intervention based on the best evidence of quality improvement in MDTs and checklist development, with input from experts and key user groups, and (2) to evaluate the content and face validity of such an intervention with key user groups in order to validate the checklist for use in MDT meetings.

METHODS

Checklist Development

To ensure content and face validity, checklist development was undertaken in 3 phases.

Phase 1 consisted of a review of the literature on clinical decision making in cancer MDTs in order to ensure that the tool captures all salient aspects.⁹ The key aspects of optimum clinical decision making that emerged for inclusion in the intervention are: (1) presence of all core team members, including those who know the patients to be discussed; (2) coverage of all relevant domains of information for all patients; (3) involvement of different professional groups; and (4) ability to reach and implement a decision.

In phase 2, in order to validate the aspects that emerged from phase 1, comparison was made with data from empirical studies of team decision making in MDT meetings.^{16,19,20} The comparison confirmed the importance of the factors listed in phase 1 for comprehensive clinical decision making.

In phase 3, the evidence base on checklist design in healthcare was reviewed. Experts in human factors/safety (N.S. and C.V.) and cancer MDT working (J.S.G. and B.W.L.) converted the list of features from phases 1 and 2 into a feasible preliminary decision-support tool or checklist for use in MDT meetings. Features of the checklist included: (1) presentation of checkpoints in a logical and functional order reflecting the flow of real-time MDT case discussion; (2) minimum information necessary to cover the major checkpoints, while allowing team members the freedom to use their own judgment; and (3) clear, bold fonts and clear coloring.^{22,23}

Upon completion of this study, the preliminary checklist was modified to take into account feedback from the evaluation process.²² The final version of the checklist is depicted in Fig. 1.

MDT-QuIC Quality Improvement Checklist

Designed to assist with clinical decision making
For use with every case discussion

National Institute for Health Research
Imperial College London
Whiston Chase University Hospital

Before case discussion:

- Are sufficient core members present?
- Is someone present who knows the patient?
- Is the patient's key worker present?

Information:

- Case History
- Comorbidities
- Radiological
- Pathological
- Psycho-social
- Patients' views
- Clinical trials
- Other

Discussion:

- Surgeons
- Physicians
- Oncologists
- Radiologists
- Pathologists
- Nurses
- Palliative care
- Allied Healthcare Professionals

Outcome:

- What are the recommendations of the MDT?
- Are there any objections?
- Does this patient need further discussion?

FIG. 1 MDT-QuIC following the development and evaluation process

Checklist Evaluation

Participants Participants were recruited between October 2010 and April 2011. Recruitment was purposive to ensure representation of professional groups who have clinical contact with patients, namely surgeons, specialist nurses, and oncologists, as well as MDT coordinators. Participants were recruited from national forums and a regional cancer network within England and were asked to forward the invitation to their colleagues in order to maximize the sample size.

Procedure MDT members were sent an electronic invitation to fill out an electronic survey via freely available software (<http://www.surveymonkey.com>). Some questions were answered on a 5-point Likert scale (1 = completely disagree; 3 = neither agree nor disagree; 5 = completely agree), some were multiple choice, and others required free text responses. The survey consisted of an evaluation of the concept of the checklist for structuring MDT discussions (content and face validity), an evaluation of potential use and users of the checklist (feasibility), a section for suggestions for improvements to the checklist, and capture of demographic information. The experimental protocols were approved by the appropriate institutional review committee and met the guidelines of their responsible governmental agency. The final version of the checklist (Fig. 1) took into account all of the feedback provided by participants.

Data Analyses Descriptive statistics are reported for each element of the evaluation (median, minimum, maximum; or percentage and 95% confidence intervals). Differences in ratings of professional groups (surgeons, oncologists, nurses, MDT coordinators) were assessed statistically using the Kruskal–Wallis test. Where significant differences were obtained, pair-wise comparisons to look for specific differences between professional groups were carried out using the Mann–Whitney *U* test. In addition, elements evaluated on a 5-point Likert scale were assessed against the scale midpoint (3) using 1-sample *t* tests. All statistical analyses were performed using SPSS version 17.0 (SPSS

Inc., Chicago, IL). Significance was taken at the 0.05 level, and Bonferroni correction was used to correct for multiple tests.

RESULTS

Characteristics of Participants

Participants included 38 surgeons, 40 oncologists, 62 nurse specialists, and 35 MDT coordinators. Of the participants, 73% worked only in urology, with 27% also working in other specialties. Also, 42% of respondents were male, 33% chaired their MDT, 87% had attended more than 100 MDT meetings, 55% attended the MDT meeting at a major cancer center, and 45% were electronically linked into a MDT meeting from a satellite hospital. There was no significant difference between healthcare professionals working only in urology and those also working in other specialties for any of the survey items.

Current Practice at MDT Meetings

Of the participants, 54% already had some structure to their MDT meetings: 58% used a proforma, 28% had an electronic patient record, and 14% used both. Also, 80% of respondents thought that a more structured way of discussing cases at the MDT meeting would aid the team's decision making.

Potential Uses of the Checklist

Table 1 and Fig. 2 display results for the evaluation of the potential uses for the checklist. Use of the checklist during the MDT meeting as a memory aid to guide discussions and as a checklist to structure discussions were most popular. Most respondents also thought that the checklist could be used prior to the MDT meeting to gather and record information or afterward to comprehensively record the MDT outcome and decision-making process. There was no significant difference between the responses of different professional groups (Kruskal–Wallis test).

TABLE 1 Responses of participants to the question, "How should the checklist be used?"

Selection of more than one answer was permitted
Significance level $P < 0.01$ after Bonferroni correction for multiple comparisons
KW test Kruskal–Wallis test

How should the checklist be used?	Yes (%)	95% Confidence interval		KW test, <i>P</i> value
		Lower bound	Upper bound	
As a memory aid to guide discussion	60.7	51.4	69.6	0.531
As a checklist to structure discussion for each case	57.3	46.9	65.4	0.867
With the MDT proforma to help prepare cases	55.6	46.0	64.5	0.565
With the MDT outcome to structure the record	53.8	43.3	61.9	0.876
None of the above	6.0	1.7	10.6	0.556

Potential Users of the Checklist

Table 2 displays results for the evaluation of the potential users of the checklist in MDT meetings. The most popular choices were the MDT chair, the coordinator, followed by the whole team. There were significant inter-professional differences for two of the questions. Regarding whether the MDT Chair should use the checklist, significantly more nurses (79% yes, 69–89% 95% CI) and surgeons (66% yes, 50–82% 95% CI) than oncologists (33% yes, 17–48% 95% CI) or MDT coordinators (26% yes, 10–41% 95% CI) gave a positive answer (all $P < 0.003$ on pairwise comparison, Mann–Whitney U test). Second, regarding whether the MDT coordinator could use the checklist, significantly more nurses (89% yes, 81–97% 95% CI) than MDT coordinators (46% yes, 28–63% 95% CI), or oncologists (38% yes, 22–53% 95% CI); and significantly more surgeons (71% yes, 56–86% 95% CI) than oncologists gave positive answers.

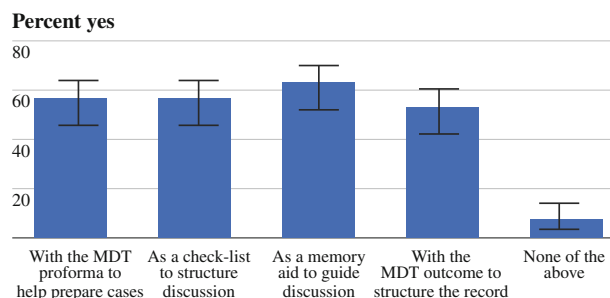


FIG. 2 Graph showing the percentage of respondents who answered “Yes” to statements regarding possible uses of the checklist. Error bars represent 95% confidence intervals

TABLE 2 Responses of participants to the question, “Who should be responsible for using the checklist?”

Who should be responsible for using the checklist?	Yes (%)	95% Confidence interval		KW test, P value
		Lower bound	Upper bound	
MDT chair	70.1	60.7	77.9	0.000*
MDT coordinator	54.7	45.1	63.7	0.000*
All MDT members	37.6	28.7	46.8	0.031
Nurses	12.8	6.9	19.5	0.567
Surgeons	7.7	2.9	12.9	0.701
Oncologists	6.0	1.7	10.6	0.696
Radiologists	3.4	0.1	6.9	0.036
Pathologists	1.7	−0.7	4.2	0.045
None of the above	2.6	−0.4	5.6	0.220

Selection of more than one answer was permitted

KW test Kruskal–Wallis test

* Significant at $P < 0.006$ level after Bonferroni correction

Attitudes to Checklist Table 3 and Fig. 3 display results for participants’ attitudes to the checklist. The median responses to all but one of the statements were significantly positive, that is, statistically higher than the scale midpoint of 3 (all $P < 0.001$, single-sample t test). The only response that failed to reach significance level was to the item “[the checklist] would allow me to contribute more to the MDT” (median = 3, Neither agree nor disagree). Moreover, some significant differences between professional groups in three statements were found. Nurses agreed significantly more (median = 4, range = 3–5) than surgeons or oncologists (both median = 4, range = 1–5) that the checklist was easy to use ($P = 0.001, <0.001$, respectively, Mann–Whitney U test). Nurses’ belief that the checklist would allow them to contribute more to the MDT (median = 4, range = 1–5) was significantly more positive than that of the surgeons, oncologists, or MDT coordinators (all median = 3, range = 1–5) (all $P < 0.001$, Mann–Whitney U test). Nurses were also more positive toward introducing the checklist to the MDT they attend (median = 4, range = 1–5) compared with oncologists (median = 3, range = 1–5).

DISCUSSION

This is the first study to develop and evaluate a checklist as a tool to support clinical decision making in cancer MDTs. The development process ensures that the checklist is evidence based, validated with expert opinion, and evaluated by users. Our evaluation data suggest that team members from across disciplines are positive toward the concept and content of the checklist as a tool to support decision making, although nurses envisage a greater improvement to their personal contribution than other groups. This is perhaps not surprising: the current evidence base shows that nurses tend to contribute significantly less than other core team members in team decision making about cancer patients.^{15,16,19,25} Moreover, our results suggest that this checklist could be used before, during, and after the MDT meeting, with the MDT chair, MDT coordinator, and other team members taking responsibility for application of the checklist in MDT working.

Currently, MDT meetings suffer from unstructured case discussion, time pressure, and variability in the quality of decision making.^{16,19,25} While information about the patient’s disease is thoroughly presented and discussed, there is strong evidence that information on comorbidities and patient’s views, as well as social and psychological considerations, is often not considered.^{15–17} In addition, MDT working has been shown to follow a traditional professional hierarchy, dominated by medical professionals, leading to the marginalization of other team members.^{15,17,20,25} Decisions regarding treatment options

TABLE 3 Responses of participants to statements regarding their attitudes toward the checklist

The checklist...	Median	Min	Max	<i>t</i> test, <i>P</i> value	KW test, <i>P</i> value
Is a good idea	4.0	1.0	5.0	0.000*	0.061
Is easy to use	4.0	1.0	5.0	0.000*	0.000*
Would improve the way my MDT runs	4.0	1.0	5.0	0.000*	0.149
Would make the MDT more patient focused	4.0	1.0	5.0	0.000*	0.019
Is something that I would like to introduce in the MDTs I attend	4.0	1.0	5.0	0.000*	0.001*
Would allow me to contribute more to the MDT	3.0	1.0	5.0	0.013	0.000*

Participants were asked to rate their agreement with each statement on a 5-point Likert scale (1 completely disagree, 3 neither agree nor disagree, 5 completely agree)

KW test Kruskal–Wallis test

* Significant at $P < 0.008$ level after Bonferroni correction

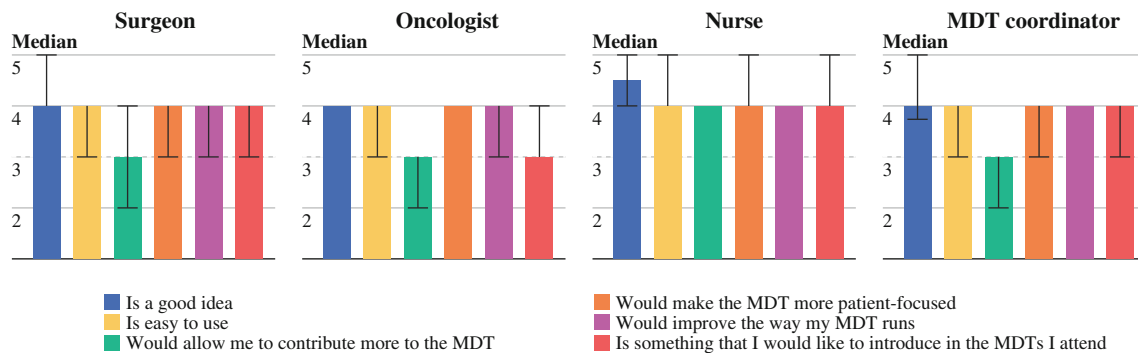


FIG. 3 Graph showing median response by professional group to statements regarding participants' attitudes toward the checklist (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree). Error bars represent 95% confidence intervals

can only be as good as the information that is available and those health care professionals who contribute to the process.²⁶ Poor-quality clinical decisions are at best less likely to be implemented, which is a waste of healthcare professionals' time and resources, and at worst could result in harm to patients.^{9,17,18} It is therefore crucial that consideration of comprehensive information and good teamwork are optimized to provide the highest possible quality of care for patients.^{9,26} The results of this study suggest that MDT members are keen to engage in processes to improve the way their teams work. Although checklists have not previously been used in the forum of MDT meetings, they may help to ensure that factors that are a prerequisite for high-quality discussion are present in order to ensure a minimum, safe standard.

Previous research into the use of decision-aids by cancer teams has demonstrated improvement in adherence to clinical practice guidelines.¹² Such interventions can restrict decision making to a predetermined algorithm, focused on the patient's disease. The checklist presented in this paper has 2 advantages over such decision aids. Firstly, the checklist does not attempt to replace the judgment of healthcare professionals (which would be entirely undesirable), but only to ensure they have the tools necessary to

make high-quality decisions. Cancer care is complex, and as such this checklist covers only the steps that are critical for good decision making, leaving decision making to healthcare professionals. Secondly, the aim of using the checklist is to ensure that the decision-making process is patient centered. Treatment recommendations are more likely to be implemented if factors such as the patients' views, their social circumstances, and other comorbidities are considered by professionals who know and have met the patients.¹⁷

Further research is needed to determine the exact procedure for implementing MDT-QuIC. Such a procedure will depend on how teams want to use MDT-QuIC: whether it is to prepare cases for discussion, to conduct discussions, or even to record discussions and share the results with patients. The presence of the appropriate team member, someone who knows the patient being discussed, and their key worker appear to be of paramount importance. In the UK, MDT meetings cannot proceed unless the meeting is "quorate".¹⁰ Anecdotally too, patients appear to prefer discussion of their case to be delayed, rather than to proceed without someone who knows them being present. Indeed, if such factors are considered important by patients then teams may have to consider sharing such information,

as well as other considerations that may be important to their decision making (such as objections of team members) with them. The requirements of different types of information and contribution to discussion of various professional groups may need to be tailored, depending on which diagnostic tests the patient has undergone and which professionals they have seen. For example, many patients referred with suspected cancer are not seen by the CNS before the initial MDT discussion, which limits their potential involvement in the MDT discussion. Once patients are given their diagnosis, the CNS is usually very involved. Depending on how teams wish to use MDT-QuIC, it may be for the Chair to decide the finer points of implementation. Of course, more work is needed to define the views of patients and healthcare professionals in relation to the exact mode of operation of MDT-QuIC and to answer remaining questions.

The differences between professional groups found in the results may reflect the previously described hierarchy that is apparent in MDT discussion and decision making.^{19,20,25} It has been well documented that nurses are often marginalized by their medical colleagues and have least input into decision making.^{15,20,25} In addition, the information that nurses bring to the clinical decision-making process, such as information about the patient's lifestyle, their social circumstances, and any emotional or psychological effects of illness, is frequently overlooked.^{15,16,20,25,27} Therefore, a holistic, structured process for case discussion may be seen by nurses as a way of increasing the engagement in discussion and of facilitating their input into clinical decisions. By the same token, surgeons and oncologists, who are already fully engaged in decision making, are less inclined to see the checklist as a means of increasing their contribution.

The interpretation of the findings of this study is subject to certain limitations. The sample used in this study was small and included only 4 professional groups. The study sample may not therefore be representative of MDT members in general. In addition, the sampling method used for the survey involved snowballing, which means that the response rate of those invited to participate cannot be determined. However, the oncologists, nurses, and MDT coordinators who participated were recruited from national forums, and surgeons from a regional cancer network, and as such represent those core MDT members who have contact with patients, from a range of locations throughout the United Kingdom. The majority of participants practiced only in urology, which means that the checklist remains to be evaluated fully for use in MDTs in other specialties. A recent UK study that examined MDT working across common tumor types found strong consensus regarding the characteristics that are necessary for effective MDT working.²⁸ These data do suggest that MDT-QuIC may be

of use to MDTs in specialties other than urology. In addition, there is a possibility that as participation was opt-in in nature, those who responded are more favorably disposed to the idea of checklists in healthcare. Therefore, the results may not be representative of MDT members in general. Overall, further replication of these results with more team members across more tumor types will reinforce the generalizability of the findings.

Our results show that just over half of participants had some form of structure in their MDT meeting, and 40% were using an electronic patient record. The use of electronic health records is increasing.²⁹ Electronic health records in cancer care can be used across the entire patient pathway to gather information and results, as well as to document treatment plans and outcomes.³⁰ Although checklists can be used for specific tasks in isolation, our results suggest that the MDT checklist could be used to improve the quality of the cancer pathway at several points—from ensuring that information is comprehensively gathered and prepared prior to the MDT meeting to making certain that MDT outcomes and treatment plans are clearly defined and recorded. Electronic patient records provide an ideal platform on which to integrate a comprehensive checklist for the preparation, discussion, and recording of clinical decisions, which could be accessed by multiple team members, from multiple sites at any point in the patient's pathway.

Our research group has taken steps to develop a tool kit, which includes validated metrics for self- and observational-assessment, so that MDTs can monitor and improve their own performance.^{16,19} As an additional component, the checklist may promote quality assurance by reducing variability and ensuring those factors that are critical to high-quality clinical decisions are not overlooked. Taken together with electronic patient records and available decision support systems, consistent use of the checklist described here could contribute to improved decision making and thus the experience and outcomes of care of cancer patients. Robust empirical evaluation will be required in the future to assess the efficacy of such interventions.

In conclusion, we developed MDT-QuIC, an evidence-based checklist for use in MDT meetings, validated by key user groups. Teams may benefit from integrating the checklist with current MDT structures, such as electronic patient records, to ensure that clinical decision making is comprehensive and patient centered across the whole care pathway. Respondents of all professional groups that participated were positive about the checklist, and interestingly nurses envisaged the greatest benefit, possibly reflecting their desire for greater engagement in clinical decision making. Work is underway to assess the feasibility of MDT-QuIC use in real-time case discussions and

evaluate its impact on MDT processes, members' well being, and patient outcomes.

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REFERENCES

- Brennan TA, Leape LL, Laird NM. Incidence of adverse events and negligence in hospitalised patients. *N Engl J Med.* 1991; 324:370–6.
- Calland JF, Guerlain S, Adams RB, Tribble CG, Foley E, Chekan EG. A systems approach to surgical safety. *Surg Endosc.* 2002;16:1005–14.
- Vincent C, Moorthy K, Sarker SK, Chang A, Darzi AW. Systems approaches to surgical quality and safety: from concept to measurement. *Ann Surg.* 2004;239:475–82.
- Kohn LT, Corrigan JM, Donaldson MS, editors. To err is human: building a safer health system. Committee on Quality of Health Care in America. Institute of Medicine. Washington, DC: National Academy; 2000.
- Lingard L, Regehr G, Orser B, Reznick R, Baker GR, Doran D, et al. Evaluation of a preoperative checklist and team briefing among surgeons, nurses, and anesthesiologists to reduce failures in communication. *Arch Surg.* 2008;143:12–7.
- Pronovost P, Needham D, Berenholtz S, Sinopoli D, Chu H, Cosgrove S, et al. An intervention to decrease catheter-related bloodstream infections in the ICU. *N Engl J Med.* 2006; 355:2725–32.
- Pronovost P, Berenholtz S, Dorman T, Lipsett PA, Simmonds T, Haraden C. Improving communication in the ICU using daily goals. *J Crit Care.* 2003;18:71–5.
- Haynes A, Weiser TG, Berry WR, Lipsitz SR, Breizat AH, Dellinger EP, et al. A surgical safety checklist to reduce morbidity and mortality in a global population. *N Engl J Med.* 2009;360:491–9.
- Lamb B, Brown K, Nagpal K, Vincent C, Green JSA, Sevdalis N. Quality of care management decisions by multidisciplinary teams: a systematic review. *Ann Surg Oncol.* 2011;18:2116–25. doi:10.1245/s10434-011-1675-6.
- Manual for cancer services. London: The Department of Health; 2004.
- Taylor C, Munro AJ, Glynne-Jones R, Griffith C, Trevatt P, Richards M, et al. Multidisciplinary team working in cancer: What is the evidence? *BMJ.* 2010;340:c951. doi:10.1136/bmj.c951.
- Newman E, Guest A, Helvie M, Roubidoux MA, Chang AE, Kleer CG, et al. Changes in surgical management resulting from case review at a breast cancer multidisciplinary tumor board. *Cancer.* 2006;107:2343–51.
- Hong NJ, Wright FC, Gagliardi AR, Paszat LF. Examining the potential relationship between multidisciplinary cancer care and patient survival: an international literature review. *J Surg Oncol.* 2010;102:125–34.
- Haward R, Amir Z, Borrill C, Dawson J, Scully J, West M, et al. Breast cancer teams: the impact of constitution, new cancer workload, and methods of operation on their effectiveness. *Br J Cancer.* 2003;89:15–22.
- Kidger J, Murdoch J, Donovan JL, Blazeby JM. Clinical decision-making in a multidisciplinary gynaecological cancer team: a qualitative study. *BJOG.* 2009;116:511–7.
- Lamb B, Sevdalis N, Mostafid H, Vincent C, Green JS. Quality improvement in multidisciplinary cancer teams: an investigation of teamwork and clinical decision-making and cross-validation of assessments. *Ann Surg Oncol.* 2011;18:3535–43.
- Blazeby JM, Wilson L, Metcalfe C, Nicklin J, English R, Donovan JL. Analysis of clinical decision-making in multidisciplinary cancer teams. *Ann Oncol.* 2006;17:457–60.
- Wood JJ, Metcalfe C, Paes A, Sylvester P, Durdey P, Thomas MG, et al. An evaluation of treatment decisions at a colorectal cancer multi-disciplinary team. *Colorectal Dis.* 2008;10:769–72.
- Lamb B, Wong H, Vincent C, Green JSA, Sevdalis N. Teamwork and team performance in urological multidisciplinary cancer teams: development and evaluation of an observational assessment tool. *BMJ Qual Saf.* 2011;20:849–56. doi:10.1136/bmjqs.2010.048660.
- Lamb B, Sevdalis N, Arora S, Pinto A, Vincent C, Green JSA. Teamwork and team decision-making in multidisciplinary cancer conferences: barriers, facilitators, and opportunities for improvement. *World J Surg.* 2011;35:1970–6. doi:10.1007/s00268-011-1152-1.
- Hales BM, Pronovost PJ. The checklist—a tool for error management and performance improvement. *J Crit Care.* 2006;21: 231–5.
- Verdaasdonk EG, Stassen LP, Widhiamara PP, Dankelman J. Requirements for the design and implementation of checklists for surgical processes. *Surg Endosc.* 2009;23:715–26.
- Hales B, Terblanche M, Fowler R, Sibbald W. Development of medical checklists for improved quality of patient care. *Int J Qual Health Care.* 2008;20:22–30.
- Winters BD, Gurses AP, Lehmann H, Sexton JB, Rampersad CJ, Pronovost PJ. Clinical review: checklists—translating evidence into practice. *Crit Care.* 2009;13:210.
- Lanceley A, Savage J, Menon U, Jacobs I. Influences on multidisciplinary team decisionmaking. *Int J Gynecol Cancer.* 2008; 18:215–22.
- Lamb B, Green JSA, Vincent C, Sevdalis N. Decision making in surgical oncology. *Surg Oncol.* 2010;20:163–8. doi:10.1016/j.suronc.2010.07.007.
- Lamb BW, Allchome P, Sevdalis N, Vincent C, Green JSA. The role of the cancer nurse specialist in the urology multidisciplinary team meeting. *Int J Urol Nurs.* 2011;5:59–64. doi:10.1111/j.1749-771X.2011.01119.x.
- Lamb BW, Sevdalis N, Taylor C, Vincent C, Green JS. Multidisciplinary team working across different tumour types: analysis of a national survey. *Ann Oncol.* 2011;19 Oct (Epub ahead of print).
- Jha AK, DesRoches CM, Campbell EG, Donelan K, Rao SR, Ferris TG, et al. Use of electronic health records in U.S. hospitals. *N Engl J Med.* 2009;360:1628–38.
- NHS Summary Care Record. <http://www.somersetpct.nhs.uk/welcome/services/nhs-summary-care-record/>. Accessed 27 June 2011.