TRAINING IN THE ASSESSMENT OF CANCER MULTIDISCIPLINARY TEAM MEETINGS COURSE MANUAL

A comprehensive manual to facilitate the assessment of team decision-making in MDT meetings
Course Developers and Faculty

Dr Tayana Soukup BSc MSc PhD
Behavioural Scientist / Applied Health Scientist
*Kings College London, Centre for Implementation Science*
tayana.soukup@kcl.ac.uk

Dr Benjamin Lamb MBBS MA MRCS PhD
Consultant Urological and Robotic Surgeon
*Cambridge University Hospitals NHS Foundation Trust*
ben.lamb@nhs.net

Prof Nick Sevdalis BSc MSc PhD
Professor of Implementation Science and Patient Safety
*Kings College London, Centre for Implementation Science*
nick.sevdalis@kcl.ac.uk

Course Advisors

Dr Louise Hull
Senior Implementation Scientist
*Kings College London, Centre for Implementation Science*
louise.hull@kcl.ac.uk

Prof James SA Green LLM FRCS (Urol.)
Consultant Urological Surgeon
*Barts Health NHS Trust*
james.green@bartshealth.nhs.uk

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The care of cancer patients is complex: increasing numbers of diagnostic tests, treatments, and increased patient empowerment in decision-making means that care can no longer be given by one or two healthcare professionals. Multidisciplinary team (MDT) working is seen as the ‘gold standard’ in many countries. MDT working at its best provides a means of improving communication and coordination between healthcare professionals with the delivery of effective and appropriate treatments in a timely manner. However, when MDTs do not work together effectively care can be sub-optimal: recommendations can be clinically inappropriate, or not acceptable to patients, resulting in delays to treatment, distress for patients and frustration for healthcare professionals. Evidence suggests that effective MDT decision-making requires consideration of comprehensive patient-centred information at the point of decision-making, with true multidisciplinary interaction and discussion, under good team leadership.

During this course we will highlight the basic principles of assessing the quality of team decision-making in MDT meetings. We will provide you with a validated framework to assess this process, the MDT Metric for the Observation of Decision-Making (MDT-MODE) instrument, and you will get hands on practice in using the instrument.
By the end of the training session, the attendees will:

1. **understand the principles behind team assessments** and **potential biases** of recognising and evaluating team skills in MDT meetings;

2. **be able to demonstrate a structured approach** for observing and assessing MDT meetings;

3. **understand how to apply** a validated framework, MDT-MODE, for observing team behaviours in MDT meetings; and

4. **have gained experience** of ‘as live’ MDT meeting assessment using MDT-MODE.
<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>09:00 – 09:20</td>
<td>Registration and refreshment</td>
</tr>
<tr>
<td>09:20 – 09:30</td>
<td>Introductions and learning objectives</td>
</tr>
<tr>
<td>09:30 – 10:00</td>
<td>What is important about MDTs and their meetings</td>
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<tr>
<td>10:00 – 11:00</td>
<td>Principles behind team assessments and introduction to biases</td>
</tr>
<tr>
<td>11:00 – 11:15</td>
<td>Break</td>
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<tr>
<td>11:15 – 12:00</td>
<td>Introduction to MDT meeting assessments</td>
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<td>12:00 – 13:00</td>
<td>Lunch</td>
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<td>13:00 – 14:45</td>
<td>Practice rating videotapes: session 1 (different cases)</td>
</tr>
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<td>14:45 – 15:00</td>
<td>Break</td>
</tr>
<tr>
<td>15:00 – 16:00</td>
<td>Practice rating videotapes: session 2 (different teams)</td>
</tr>
<tr>
<td>16:00 – 17:00</td>
<td>Discussion &amp; troubleshooting</td>
</tr>
<tr>
<td>17:00</td>
<td>Close</td>
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</tbody>
</table>
Training in the assessment of multidisciplinary team meetings

Dr Tayana Soukup PhD
Dr Ben Lamb MBBS PhD FRCS (Urol.)

Core components of the training

1. Importance of MDTs in cancer care
2. Principles behind team assessment
3. Introduction to MDM assessment
4. Training & Practice in MDM assessment
5. Discussion
1. WHAT IS IMPORTANT ABOUT MULTIDISCIPLINARY TEAMS AND THEIR MEETINGS?
MDT v. MDM

**MDT**, Multidisciplinary team = a group of people from different health-care disciplines that coordinates care for patients

**MDM**, Multidisciplinary team meeting = a forum for the MDT; a major information processing infrastructure in cancer care

Department of Health, 2004

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Making recommendations v. decisions

**Recommendation(s)** = suggestion(s) or proposal(s) as to the best course of action

**Decision-making** = cognitive process resulting in the selection of one or more courses of action among several alternative possibilities

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Multidisciplinary team meeting

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Post-Meeting

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Orientation Discussion Decision Implementation

- No information
- No decision
- Carrying out the decision
- Evaluating the decision

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Why care about teams in healthcare?

1. Patient safety
2. Cost-effectiveness
1. TEAMWORK & PATIENT SAFETY

• Institute of Medicine (2000): Increased awareness of medical errors

• Concluded that between 44,000 to 98,000 people die each year as a result of preventable medical errors

• Key recommendation: Teamwork as a mechanism for enhancing patient safety

2. COST-EFFECTIVENESS

• The attendance register was completed in 14 MDMs
  • 147 out of 294 consultants on the register attended, 10 of 43 junior doctors and 41 of 100 ‘others’

• The total number of patients discussed was 431
  • total time allocated through the week for these 14 MDMs was 30 hours (2.14 hours per MDM).

• The average salary of a consultant is £115,4005, the average salary of a specialist registrar is £56,1005 and the average band 7 nurse specialist earns £35,0005

• The average consultant works 50.7 hours a week, the average junior doctor should work 48.6 hours a week and the nursing staff 37.5 hrs

• The approximate cost of a week’s worth of MDMs in salaries alone can be estimated at £15,808.8

• The average annual cost of MDMs in salaries alone is approximately £822,057.6

• In salaries alone the cost to discuss each patient is £36.6

Fosler et al. The cost of the MDT. BMJ 2010;340:c951
https://www.bmj.com/rapid-response/2011/11/02/cost-mdt
2. COST-EFFECTIVENESS (CONT.)

Cost in relation to radiologists and pathologists:

There are approximately 1500 cancer MDTs in England, and based simply on data about the time taken for radiologists and pathologists to prepare for MDMs, it has been estimated they cost:

£100 million a year for attendance and preparation time


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2. COST-EFFECTIVENESS (CONT.)

- Workload for MDTs
- Costs to NHS
- Complexity of care pathway with non-linear steps for patients

Start

Orientation

- Defining problem, goals
- Planning the process
- Developing shared mental model

No Information

Dimension

- Remembering information
- Exchanging information
- Processing information
- Detecting incoherent information

No decision

Decision

No implementation

Implementation

Carrying out the decision

Evaluating the decision

Multidisciplinary team meeting

Orientation-Discussion-Decision-Implementation (ODDI) Model of Team Decision-Making


WHAT DOES THE MDT DO?

- Takes referrals
- Arranges investigation and diagnosis
- Discusses cases in the MDT meeting
- Plans treatment and follow-up
- Cases of suspected or diagnosed cancer
- All new, some recurrences

EFFECTIVENESS OF MDTs

- Some positive studies
- Generally variable evidence base across tumour types
WHAT AFFECTS QUALITY OF MDT DECISION MAKING?

Clinical Decision Making

- Attendance
- Communication
- Disease-related Information
- Implementation of decisions
- Facilities
- Open discussion
- Expert review of information
- Teamworking
- Leadership
- Patient centred information


THE MDT PROCESS

TEAM INPUTS ➔ TEAM PROCESSES ➔ TEAM OUTPUTS

Lamb, Green, Vincent, Sevdalis, Surg Oncol 2011;20:163-8
THE MDT PROCESS

**TEAM INPUTS** ➔ **TEAM PROCESSES** ➔ **TEAM OUTPUTS**

- Attendance  
  - Expertise  
  - Information  
  - Equipment

- Expert review  
  - Teamwork  
  - Open discussion  
  - Leadership

- Decision  
  - Implementation  
  - Documentation  
  - Communication  
  - Research

**MDT MEETING**


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INPUTS TO MDT

**Information**
- To make clinical decisions (48-82%)
  - Radiological
  - Pathological
  - Personal Knowledge of patients
- To implement decisions (81-96%)
  - Clinical Information
  - Co-morbidities
  - Patient preference

MDT PROCESS & FUNCTION

Consideration of holistic information
• Doctors and Nurses have different skills
• Combining biomedical and patient centred information

Team working
• Hierarchies harm patient centeredness
• Collaboration, trust and respect improve members contribution


MDT OUTPUTS

Dealing with disagreement
• Document
• Share with patients?

Communication with patients
• Medical and Nursing roles

Communication with Primary care

Lamb et al, 2007
**Complete patient profile and input from all disciplines in MDMs are needed to reach treatment recommendation for a patient**

**Radiology**
Radiological information
Radiologists’ input

**Pathology**
Pathological information
Pathologists’ input

**Holistic & Clinical Inputs**
- Patient history
- Comorbidity
- Psychosocial information
- Patient views
- Surgeons’ input
- Oncologists’ input
- Nurses’ input

**Meeting Management**
Chair’s input
Coordinator’s input

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**WHY DOES A MDT FAIL TO MAKE A DECISION?**

1. Lack of clinical or staging information
2. Lack of personal knowledge of patient
3. Lack of information on co-morbidities
4. Poor attendance
5. Disagreement
6. Case complexity

Order of importance

“We can only be sure to improve what we can actually measure”

Professor A Darzi
High Quality Care for All
Department of Health (UK) 2008

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**Tools and what they measure**

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Questions?

2. Principles behind team assessments
**Non-technical skills**
(e.g. communication, teamwork)

70% of adverse events in healthcare (as well as flight accidents in aviation)

[Source: The human factor: the critical importance of effective teamwork and communication in providing safe care](https://qualitysafety.bmj.com/content/13/suppl_1/i85)


**Airlines are required to evaluate crew (nontechnical) performance in simulated settings using an observational assessment approach**

Training is important!
Gold Standards approach to training

- Calibrate new assessors to the expert/most experienced assessor
- Use standardized/validated tools
- Increase reliability of evaluations – by providing introduction, instruction and practice in scoring so that all assessors give similar scores to similar performance
- Score videotapes with different scenarios
  1) Identification & observation of behaviours
  2) Scoring of relevant behaviours

Most successful & meaningful evaluations are when evaluators are trained based on gold standards!!
Expert consensus on the training requirements

- Health care professionals and psychologists/human factor specialists best placed to do the assessments
- Assessing others’ skills is a skill in itself!
- Evidence suggests that considerable training is required to use tools in a valid and reliable manner
- Min. level of calibration between new and experienced assessor is an intraclass correlation coefficient of:
  - 0.60 for the purpose of providing formative feedback
  - 0.70 for research purpose

Why are the gold standards in training and assessment important?

“To prevent unreliable assessments which could be unfair and potentially damaging for the individual being assessed”
Principles behind team assessments

WHAT IS A GOOD ASSESSMENT?

Assessor: Fair, Objective, Unbiased → Trained

Assessment Process: Reliable, Valid, Accurate, Fair → Robust Assessment Instruments/Tools

Assessee: Informed, Engaged → Feedback
**WHAT IS AN ASSESSMENT (DEFINITION)?**

5-Stage Process

1. OBSERVATION
2. RECORDING
3. INTERPRETATION
4. EVALUATION
5. FEEDBACK
Assessment Components

**OBSERVATION**
- of a behaviour involves:
  - Detection
  - Perception
  - Recall
  [of behavioural events]

**NUMERICAL SCORING**
- of observation involves:
  - Categorisation
  - Integration
  - Evaluation
  [of what was observed]

**ASSESSORS’ BIASES / ERRORS**
Rater Error Training (RET)

- **Familiarise** assessors with errors and biases
- Increase their error/bias awareness
- Improve **assessors’ skill** in recognising their own *prejudices* and in *discriminating and judging* behaviours
- Create **common standards** for what constitutes good or poor performance in order to avoid biases arising from our personal standards or preferences

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**Assessment Components**

- **Observation of a behaviour**
- **Detection**
  - Perception
  - Recall
  [of behavioural events]

**Biases in Observation of Behaviour**

- We do **not see/detect** a behaviour
  e.g. Leadership behaviour shown, but assessor misses it
- We **mis-perceive** a behaviour
  e.g. Leadership behaviour shown, but assessor attributes it to communication
- We **forget** a behaviour
  e.g. Leadership behaviour shown, but assessor forgets it
Biases in Scoring of observed behaviour

- We mis-categorise a behaviour e.g. Leadership gets categorised as communication → leadership scored low
- We cannot integrate behaviours e.g. Too much focus on one occasion where leadership was lacking or excellent drives scoring
- We misuse the scale e.g. A moderately good behaviour is scored as exemplary

Numerical scoring of observations

Categorisation
Integration
Evaluation
[of what was observed]

COMMON RATING ERRORS

HALO EFFECT - one particular positive aspect of behaviour is overemphasised and enhances the ratings on other behavioural dimensions

Horns EFFECT - one particular negative aspect of behaviour is overemphasised and reduces the ratings on other behavioural dimensions

CENTRAL TENDENCY - ratings mainly given around the mid-point of the scale
COMMON RATING ERRORS (CONT.)

LENIENCY - tendency to give favourable (higher) ratings

SEVERITY - tendency to give unfavourable (lower) ratings

PRIMACY - remembering better/overweighting behaviours that were observed first

RECENTY - remembering better/overweighting behaviours that were observed last

ADDITIONAL POTENTIAL PITFALLS

NON-BLINDED RATINGS
- Knowing team-members
- Previous knowledge of performance/ability

TEAM-MEMBER & ASSESSOR
- Your behaviour will influence the behaviour of other team members
- Can interfere with the observation and assessment
- May be too demanding (workload)

HAUGHTON EFFECT / OBSERVER EFFECT
- Knowledge of being assessed → 'angel performance'

TIME-ON-TASK EFFECTS
- Prolonged cognitive activity can lead to task detriments
REMEMBER...

A biased assessment is one or all of the below:

- Unreliable
- Invalid
- Unfair
- Inaccurate

A biased assessment is **WORSE** than no assessment at all!!

Because...

“**unreliable / invalid assessments**
could be unfair and potentially damaging for the individual clinician being assessed”

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Training Faculty in Non-technical Skill Assessment
National Guidelines on Program Requirements
Louise Foul, MSc, Samuel, DM, Nicholas R.A. Symons, MSc, Rob, JSD, MCSE, Anh Bui, FACS, Charles Vance, PhD, and Nick Grozales, PhD
Invalid/unreliable assessments are also **bad science**: psychometric properties of tools are **important!**

A measure has to be reliable, before it can be valid, but reliability does not imply validity!

**Questions?**
Break time (15min)

"Gentlemen - ladies - I propose we take a short break.

3. Introduction to MDM assessments
CAN TEAM PERFORMANCE IN MDT MEETINGS BE MEASURED SCIENTIFICALLY?

“We can only be sure to improve what we can actually measure”

Professor A Darzi
High Quality Care for All
Department of Health (UK) 2008

DEVELOPING AN INSTRUMENT...

Teamwork and team performance in multidisciplinary cancer teams: development and evaluation of an observational assessment tool

Original research

MDT-MODE

Quality Improvement in Multidisciplinary Cancer Teams: An Investigation of Teamwork and Clinical Decision-Making and Cross-Validation of Assessments

ORIGINAL ARTICLE: HEALTHCARE POLICY AND OUTCOMES

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HOW DO WE ASSESS MDT SCIENTIFICALLY?

Assessing quality of information

<table>
<thead>
<tr>
<th>Information</th>
<th>Hx</th>
<th>X-ray</th>
<th>Path</th>
<th>Psy/occ</th>
<th>comorbidity</th>
<th>Patient view</th>
</tr>
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<tbody>
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Assessing quality of contributions

Discussion

<table>
<thead>
<tr>
<th>surg</th>
<th>Phys</th>
<th>oncolo</th>
<th>Nurse</th>
<th>Radiolo</th>
<th>Histopath</th>
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Scales and scoring anchors for assessors


EXEMPLAR BEHAVIOURS & ANCHORS

- Observable
- Indicate better/worse performance
- Used to guide ratings

*LOOK AT THE MDT-MODE FORM*

MDT-MODE RATING SCALE

- 5-point scale
- Anchors vary slightly

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor, inadequate, no information, absent contribution</td>
<td>Average, with some vagueness or inconsistencies</td>
<td>Good, comprehensive information &amp; fluid contribution</td>
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COMPROMISED ← --- Decision-Making --- → ENHANCED
**Course Content**

**STRUCTURE OF MDT-MODE**

*Domains:*
1. Type of case
2. Quality of Information
3. Quality of Contribution
4. Outcome

**Comprehensive assessment:**
- *Every case* rated independently
- 13 Ratings/case (6,1,6)
- At **disciplinary group-level** with unit of analysis being the case-discussion

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**Disciplinary group-level** assessment with the unit of analysis being a case-discussion (and not an individual team member!)

“Such approach has advantages when evaluating a team because it ensures team safety by minimizing the risk of defensive routine and blaming a particular team member for performance difficulties which could in turn distract the team from addressing their performance problems constructively.”

Soukup et al. Do multidisciplinary cancer teams suffer decision making fatigue? BMJ Open. [https://bmjopen.bmj.com/content/9/5/e027303](https://bmjopen.bmj.com/content/9/5/e027303)
QUALITY OF INFORMATION

Case history
- Details of specific episode
- Background information e.g. symptoms, presentation

Radiological information
- Explained in detail by radiologist
- CT/MRI/X-ray images
- Reports of radiological investigations

Histopathological information
- Explained in detail by histopathologist
- Specimen slides
- Histology/cytology reports

QUALITY OF INFORMATION (CONT.)

Comorbidities
- Other illnesses/conditions
- Medications
- Performance score (on a standardised test)

Psychosocial (psychological and social aspects)
- Social circumstances e.g. cared for, carer, distance travel, deprivation
- Activities of Daily Living (ADLs)/independence
- Psychopathology e.g. mental illness, drug and alcohol problems

Patients’ views
- Regarding diagnosis
- Regarding treatment options
QUALITY OF CONTRIBUTION

Team members
- Surgeon
- Physician
- Oncologist
- Nurse
- Radiologist
- Histopathologist

• Contribution to discussion/decision-making of team members of given speciality
• Including interpretation and evaluation of information

Chairing
- Leadership behaviour of chair
- May be fluid
- Different chairing/leadership styles
- See ATLAS tool

ADDITIONAL DETAIL

Pathway
- Pre-treatment/post-treatment/recurrence
- Point on patient journey at which MDM is taking place
- Helps to rationalise assessment

Tumour
- Tumour type or site
- Helps to rationalise assessment

Decision (has a decision been reached?)
- Observed from sitting in the meeting
- Recorded by MDT administrator
- Taken from meeting minutes
SOME CAVEATS

- Physicians not members of all MDTs
- Record co-morbidity and psychosocial factors separately from history
- Sometimes pathology or radiology are not applicable; please record N/A
  - E.g. pre-surgery MDM review of imaging
  - E.g. post-surgical MDM review of pathology

- Also...

Team assessment has a learning curve

- Used by clinical and non-clinical professionals
- They ALL require training!

Team assessment v. self-assessment

- MDT-MODE picks up similar pattern with self-assessment
- But self-assessment way more flattering!


The most widely used MDT tool across different cancers, teams and countries

- Across various cancer:
  - Urology
  - Colorectal
  - Upper GI
  - Head & Neck
  - Breast
  - Lung
  - Gynaecological

Assessment can be done in:
- real time, or
- retrospective (from recording)
Questions?

Lunch time (60min)

"GENTLEMEN - LADIES - I PROPOSE WE TAKE A SHORT BREAK."
4. Practical session

*LOOK AT THE MDT-MODe FORM*

MDT-MODE TRAINING

1. Please sign the confidentiality agreement

2. Please rate cases according to their number on the score sheet

3. Please retain your score sheet for collection at the end of the day
   - We will use the anonymised data to evaluate the effectiveness of the training
4. Finding out who's who

5. Rating information and contribution
   • Examples of better behaviours
   • Examples of worse behaviours

6. Rating
   • Single cases within one team
   • Series of cases within one team
   • Single cases in different teams

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View MDT video

↓

Independently rate the team using MDT-MODE

↓

Group discussion
Practical session 1: Rating different cases

Practical session 2: Rating different teams
Score individually without discussion.

Watch video.

See ratings on screen.

Discussion:
• Who gave 5? Why?
• Who gave 1? Why?
• What challenges did you encounter?
Tools and what they measure

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IMPROVING MDT QUALITY

Study example 1:

- 1421 cases studied
- Ability to reach decisions 82.2 → 92.7% (P<0.05)
- Quality of information 29.6 → 38.3% (P<0.05)
- Quality of teamworking 37.8 → 43.0% (P<0.05)
- The ability to reach decisions related to
  - quality of information (r=0.298, P<0.05)
  - quality of teamworking (r=0.348, P<0.05)
Study example 1 (cont.):

Quality Improvement Checklist (MDT-QuIC)

Development:
* Phase 1. Literature review
* Phase 2. Validation
* Phase 3. Expert review
* Phase 4. Evaluation by MDT members


IMPROVING MDT QUALITY

Study example 2:

<table>
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<th>Correlations</th>
<th>Meeting characteristics</th>
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<tr>
<td>Ordinal position of patients within meetings</td>
<td>Average meeting duration (range)</td>
</tr>
<tr>
<td>Baseline</td>
<td>Average</td>
</tr>
<tr>
<td>Audit Cycle 1</td>
<td>-0.254*</td>
</tr>
<tr>
<td>Audit Cycle 2</td>
<td>-0.206*</td>
</tr>
<tr>
<td>Audit Cycle 3</td>
<td>-0.078</td>
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Note: Ordinal position is a counter that increases for each decision in the meeting. *p < .01, table entries are Pearson r coefficients. N=1335.

http://bmiopen.bmj.com/content/full/bmiopen-2018-027303
Team Audit and Feedback
[Identify, Assess, Feedback, Improve]

1. IDENTIFY a problem (an area that would benefit from improvement)
2. ASSESS: Team's baseline performance
3. FEEDBACK results to the team, and agree on improvements
4. IMPROVE: Implement the change
5. REPEAT (steps 2 to 4)

EVIDENCE-BASED:
Non-punitive and actionable feedback provided to professionals to allow them to assess and adjust their performance is effective in improving practice and supporting quality and safety in healthcare settings.
Flottorp et al., 2010; Michie et al., 2005; Ivers et al., 2012
**Analysis (cont.)**

**Scores can be averaged by:**

- **Individual variables** (red vertical lines)
- **Domains i.e. information score, and contribution score** (orange vertical lines)
- **Global MDT-MODE score** (aggregated across all variables; green horizontal line)

**Some considerations:**

- Pay attention to numerator and denominator when averaging scores to exclude N/A cases
- Consider converting to decimal fraction (e.g. 0.5, 0.7 etc.) or %

**Compare MODE scores to other variables of interest:**

- **Outcome of discussion** (decision; blue vertical lines)
- **Case order** (serial number; purple vertical line)
- Length of discussion, length of meeting
- Clinical information
- Attendance
MDMs are a unique part of the cancer care pathway with multiple underlying complexities impacting team performance.

The task/goal in MDM:
- Treatment recommendation
- Interactive
- Repeated

External circumstances:
- Cancer incidence/workload
- Financial/economic pressures
- Capacity issues/staff shortages
- Time pressures

Internal factors/human factors:
- Teamwork
- Communication
- Leadership
- Individual differences
- Professional diversity
- Authority gradients
- Team size

External circumstances (cont.):
- Advances in technology
- Multiple treatment options, incl. ongoing assessments and interventions
- Patient individual differences, circumstances & preferences
- Guidelines and regulations (e.g., mandatory model of care)

Human factors (cont.):
- Burnout/fatigue

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Mistry et al. 2011; WHO 2014; NHS England 2014; CRUK 2017

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Functional perspective of cancer MDT decision-making

Complexity of cases

Human factors and external circumstances

Team work in MDMs

MDT Outcome (quality, productivity, efficiency etc.)

1. Can vary
2. Can be measured
3. Can be regulated
   [MDM assessment]

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### Guidelines v. evidence/shortfalls (important for benchmarking)

#### Guidelines & Recommendations
- MDTs are gold standard (NICE, DoH):
  - diversity brings best performance;
  - best equipped to address complex needs in cancer;
  - opportunity for expert review thus optimising care and improving patient outcomes
- Patient-centred holistic approach needed for high-quality care and efficiency
- Integration of psychosocial factors into routine cancer care, from diagnosis to survivorship for every patient
- More focus on complex cases
- MDTs should be supported to use validated tools and streamline their processes where possible

#### Scientific Evidence
- Diversity of expertise not utilised to full effect
  - Unequal participation in discussion (cost! Also, fidelity!)
  - “I am always amazed how very able staff can be so passive”
- 16% of decisions not implementable
- In 27-52% of cases decision not reachable in MDM
- Lack of consideration of patients views, their comorbidities and their psychosocial aspects
  - negatively affects ability to implement recommendations
  - Yet psychosocial information has a positive impact on the team ability to make recommendation
- Increased workload and meetings are taking longer (prolonged meetings becoming a norm for many teams)
  - Tool that can gauge complexity of cases exists (see MeDiC)
- A number of validated tools for MDTs exist

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### Some practical considerations

- **Who** is going to do the assessment?
- **Time and resources** available for the assessment.
- **What MDT** are you going to assess?
- Get to know the team and **who is who**.
- Inform the team about the assessments.
- Position yourself discretely in the meeting room (to reduce bias).
- Assessment of first one to two meetings should be **practice only** (to reduce bias).
- Feed back the results to the MDT to keep them **engaged and informed**.
5. Questions & Troubleshooting

How would you improve your MDM?

THANK YOU

Tayana.Soukup@kcl.ac.uk
Ben.Lamb@nhs.net
@TayanaSoukup
@LambWBen

National Cancer Institute:
Multidisciplinary Teams Cyber Discussion Series
https://healthcaredelivery.cancer.gov/cyberseminars/
MDT-MODE BACKGROUND EVIDENCE:


   This paper reports a qualitative interview study with members of MDTs assessing factors that affect team decision-making – including the environment, teamworking, information use and leadership.


   This review presents an ‘input-process-output’ model for the evaluation of cancer MDT working and decision-making.


   This review systematically evaluates the available evidence base to identify the effectiveness of cancer MDT decision making and factors that impact on it.


   This paper describes a qualitative interview study that assesses factors considered important by experienced MDT members when reaching clinical management plans.

MDT-MODE DEVELOPMENT, VALIDATION & APPLICATION:


   This paper describes the development of MDT-MODE with initial validation and assessment of inter-rater reliability.

This paper reports correlations between observational evaluations of cancer teams using MDT-MoDe and team members’ own self-assessments of their performance.


This paper reports the development and expert validation of a checklist for use in MDT meetings, informed by the MDT-MoDe elements.


This paper presents the results of a longitudinal study to assess the effectiveness of a quality improvement bundle for use in cancer MDTs, using MDT-MoDe as the assessment tool.


This study analyses correlation between quality of case review assessed via MDT-MoDe and organisational factors affecting the team (incl. caseload, team-members in attendance, and others).


This paper reports MDT-MoDe construct validation study that shows that cases where a cancer team makes a decision have higher MDT-MoDe scores than those where a decision cannot be made. It also reports data on the validation of the tool for use with video-recorded MDT meetings.

_This paper reports how different elements of the decision process, from radiology and imaging to information on psychosocial aspects and comorbidities affect multidisciplinary teams’ ability to reach a decision on a first case review in their meetings._


_This paper explores the underlying structure of multidisciplinary decision-making processes in the context of their weekly meetings on 1045 patients with cancer._


_This paper presents an evaluation of clinical decision-making in breast cancer MDT meetings. It shows significant differences in the type of input and information considered during case reviews._


_This paper is relevant to MDTs with high workload and long meetings. It examines effectiveness of codesigned quality-improving interventions with a multidisciplinary team (MDT) with high workload and prolonged meetings to ascertain: (1) presence and impact of decision-making (DM) fatigue on team performance, and (2) impact of a short meeting break as a countermeasure of DM fatigue._

This paper is relevant for MDTs with very high workload and long meetings. It synthesizes theory, evidence and clinical practice across 167 scientific papers in order to bring current understanding of prolonged, repeated decision-making into the context of cancer MDMs. We explore how and why prolonged cognitive activity affects task performance in such settings, and what strategies can be employed by cancer teams to counteract negative effects and improve quality and patient safety.

FURTHER RELATED MDT PAPERS:


This paper presents a review the role of urology Cancer Nurse Specialists in cancer MDTs.


This paper reports a survey study of urological oncologists in the UK assessing their views of current practice of cancer MDT working, including team leadership.


This paper present quantitative data from a UK national survey of MDT members regarding attitudes to MDT working, and makes statistical comparison between members of MDTs of different tumour types.

This paper reports qualitative data from a UK national survey of MDT members regarding their attitudes towards the representation of patients at MDT meetings, and communication of decisions with patients.


This paper presents a study of UK MDT coordinators (administrative personnel) regarding their views on MDT working.


This paper reports a qualitative study with cancer patients regarding their views on and experiences of interaction with the cancer MDT.


This paper explores the comparison between safety in aviation and healthcare, following set up of an Independent Patient Safety Investigation Service. It concludes that healthcare should emulate aviation in its resourcing of staff, and that professional and post-qualification staff training could specifically include Cognitive Bias Avoidance Training, as this appears to play a key part in many errors relating to patient safety and staff wellbeing.


This paper discusses importance of field research in healthcare, as well as some of the challenges encountered by researchers. It highlights greater need for field research in healthcare.
PREPRINTS (UPCOMING WORK):


*This paper explores communication between team members in cancer MDMs and how it is related to the quality of decision-making. It reveals difficulties in some teams in obtaining a turn to speak during case reviews.*


*This paper examines the degree to which case reviews in MDT meetings are truly multidisciplinary. It concludes with 8 formats of decision-making with the least common being multidisciplinary.*


*This paper examines MDT meetings using three tools measuring quality of decision-making, interactions and clinical complexity across 822 patients. It reveals that while patient-discussions are significantly simpler in the 2nd half of the meeting, there is significantly less time left to discuss the remaining patients. Teams are rapidly attempting to close the time-workload gap and reach a recommendation, which adds to team cognitive load.*
FURTHER TOOLS:


This paper contains a list of available tools for MDTs. It is also an up-to-date summary of the current knowledgebase on MDTs and their meetings that those planning or leading cancer services can use as a guide for service implementation or improvement. Copy of this paper is in the appendix.


This paper reports early validation and development of a tool for MDTs that measures leadership and chairing skills in MDT meetings.


This paper reports first evidence-based and expert-driven tool that gauges the complexity of cancer cases, namely, MeDiC. The tool could be used to improve cancer MDM-working through case selection and prioritisation. For example, cases could be ordered by complexity with more complex cases receiving MDT discussion, and those that are less complex treated according to pre-defined guidelines and/or discussed in a smaller ‘straightforward-case’ MDM.

For more information on the MeDiC instrument, contact Tayana, tayana.soukup@kcl.ac.uk.
Appendix A: Successful strategies paper with MDT tools

Appendix B: Copy of the MDT-MODe scoring sheet

Appendix C: Blank notes pages

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Successful strategies in implementing a multidisciplinary team working in the care of patients with cancer: an overview and synthesis of the available literature

Tayana Soukup¹
Benjamin W Lamb²
Sonal Arora¹
Ara Darzi³
Nick Svedalis¹
James SA Green⁴,⁵

¹Health Service and Population Research Department, Centre for Implementation Science, King’s College London, London, UK;
²Department of Surgical Oncology, Peter MacCallum Cancer Centre, Melbourne, VIC, Australia;
³Department of Surgery and Cancer, Center for Patient Safety and Service Quality, Imperial College London,
⁴Whipps Cross University Hospital, Barts Health NHS Trust, ²Faculty of Health and Social Care, London South Bank University, London, UK

Abstract: In many health care systems globally, cancer care is driven by multidisciplinary cancer teams (MDTs). A large number of studies in the past few years and across different literature have been performed to better understand how these teams work and how they manage patient care. The aim of our literature review is to synthesize current scientific and clinical understanding on cancer MDTs and their organization; this, in turn, should provide an up-to-date summary of the current knowledge that those planning or leading cancer services can use as a guide for service implementation or improvement. We describe the characteristics of an effective MDT and factors that influence how these teams work. A range of factors pertaining to teamwork, availability of patient information, leadership, team and meeting management, and workload can affect how well MDTs are implemented within patient care. We also review how to assess and improve these teams. We present a range of instruments designed to be used with cancer MDTs – including observational tools, self-assessments, and checklists. We conclude with a practical outline of what appears to be the best practices to implement (Dos) and practices to avoid (Don’ts) when setting up MDT-driven cancer care.

Keywords: cancer MDT, MDM, cancer meeting, patients with cancer

Introduction

The concept of multidisciplinary team (MDT) working is widely accepted as the “gold standard” of cancer care delivery across the world. The cancer MDTs, and MDT meetings (MDMs) in particular, are at the center of an increasingly complex health care system. Figure 1 offers our conceptualization of modern MDT-driven care, which we apply to an extent to the rest of this paper. Effective MDT-driven care depends on a multitude of inputs (individuals, teams, environment, and patients) and processes (interactions, tests, results). It subsequently results in a range of outputs (patient experience, outcomes, organizational outcomes), which taken together are aspired to achieve high-quality, efficient care for patients.

The literature describing MDT working in cancer care is diverse and increasing in scope and volume with an increasing number of systematic¹–³,⁸ and other reviews.⁵ The field is growing, as many disciplines alongside traditional health care effectiveness reviewing methodology are becoming involved in understanding MDT working, including psychology, improvement science, organizational science, and others. The diversity of the evidence base in itself presents a challenge to health care professionals,
patients and their advocates, as well as those involved in health care organization, who want to improve the care of patients with cancer.

There is, therefore, need for the diverse evidence we have on what “works” in implementing MDTs in cancer care and what factors impact on care delivery to be reviewed in an integrated manner. This is what the present review aims to achieve in offering an integrative overview of diverse studies on cancer MDTs and their functioning. Specifically, the aim of our literature review is to synthesize current scientific and clinical understanding on cancer MDTs and their organization; this, in turn, should provide an up-to-date summary of the current knowledge that those planning or leading cancer services can use as a guide for service implementation or improvement.

**Methods**

In order to identify the relevant literature, we undertook a literature search of PubMed using the search terms “decision-making”, “cancer”, “multidisciplinary”, and “team”; we also hand-searched studies by consulting with experts in the field and by scrutinizing reference lists of retrieved papers, exist-
ing reviews, guidelines, and governmental documents. The
search was limited to human beings, English language, and
dates of publication ranging from 1999 to September 2017.

Overview of evidence
The retrieved evidence is organized into the following
five domains that appear critical for effective cancer MDT
working:

1. Background to multidisciplinary teams in cancer care.
2. Key performance indicators of effective teams and their
meetings.
3. Factors that are known to affect team processes.
4. Assessment of cancer MDT working.
5. Improvement of cancer MDT working and its impact on
patient care.

Background to multidisciplinary teams in
cancer care
Cancer MDTs are made up of surgeons, oncologists, radiolo-
gists, pathologists, specialist cancer nurses, physicians, and
meeting coordinators who usually meet on a regular basis
(e.g., weekly) in cancer MDMs in order to discuss and agree
on the care plan for patients with suspected or confirmed
cancer. One of the core team members, often the MDT lead,
tends to also chair the meeting, although variations between
teams exist, with some not having a chair. The diagnosis
and treatment of cancer involves a complex care pathway.5
To ensure consistency, the UK’s Department of Health6,7 has
made MDMs obligatory in order to ensure reliable and equi-
table delivery of safe and high-quality care that is necessary to
improve patient outcomes – to all cancer patients. The MDM
(sometimes termed a cancer conference or tumor board) is
thus an integral part of cancer care services in the UK,
where it is embedded in the cancer care pathway (Figure 1)
and in other countries globally. It is intended to improve the
consistency and quality of cancer care locally, regionally, and
nationally. Even in countries where MDMs are not mandated,
a need for a multi-team system for effective coordination of
cancer care has been identified.1

The efficacy of the MDT-based approach to cancer care
is poorly understood, however. Indeed, the empirical evidence
for MDMs is mixed and unclear,4 and their impact on
patient outcomes, and in particular on the survival of patients
with cancer, is uncertain. For instance, one study showed
improvement in survival of patients with inoperable lung
cancer from 3.2 to 6.6 months as a result of MDTs, although
the authors noted that this could be due to other factors as
well since cancer care is complex.7 The MDT approach was
found to encourage positive changes to care management,10
where it was found to outperform diagnostic tests11 and lead
to modification of diagnosis.12 Other researchers, however,
have found no difference in diagnosis pre- and post-MDM
review.13,14 More recently, research has also focused on MDMs
identifying and improving various aspects of MDM working,
such as the quality and efficacy of clinical decisions
using methodologies ranging from surveys and interviews
to observation and checklists (see also Table 1 for a list of
tools available to assess MDTs that was generated from this
evidence base).8,15–17

One reason for inconsistent results in research examin-
ing the functioning of cancer MDMs, however, could be the
fact that novel treatments, technology, and service changes
have all evolved in parallel to MDMs and potentially have
confounded the findings.15 What is more, designing studies
to assess effectiveness has proven difficult; for instance, in
the UK, MDMs are mandatory in cancer care and, therefore,
orthodox comparative studies, i.e., randomized controlled
trials, are not possible.15,16 In addition, implementation of the
MDT model of care in itself has some inherent variations
since it relies on health care providers delivering it at the
frontline, and this introduces human factors into the equation.
For instance, in MDMs, decision-making process, team work-
ing and interactions, leadership (including chairing), team
climate, treatment implementation, team ability to reach a
care plan on a first case-presentation, and also waiting times,
appropriate use of resources including technologies, as well
as patient and health care professional satisfaction with care
and quality of life, could be further examined.15,16,18 Periodic
survival evaluation of the population as a whole as well as
prospective longitudinal studies of treatment implementation
may also be useful indicators of team effectiveness.19

It is, therefore, crucial to advance our understanding of
the intended advantages of MDMs through the in-depth study
of the behaviors, processes, context, and organization of this
approach to patient care.19–22

Performance indicators of effective teams
and their meetings
For a number of years after the inception of MDTs, there
was an absence of empirical evidence about the potential
factors that made MDTs effective. This changed in 2010
when the National Cancer Action Team (NCAT) in England
defined indicators for highly functioning MDTs, termed “the
characteristics of an effective MDT”23 including effective
team meetings (these characteristics are outlined in Table 2).
Table 2 Characteristics of an effective multidisciplinary team for cancer patients

<table>
<thead>
<tr>
<th>I. The Team</th>
<th>II. Infrastructure for MDM</th>
<th>III. MDM organization</th>
<th>IV. Logistics</th>
<th>V. Patient-centered clinical decision-making</th>
<th>VI. Team governance</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Level of expertise and specialization</td>
<td>• Appropriate meeting room</td>
<td>• Regular meetings</td>
<td>• Preparation for meetings</td>
<td>• Who to discuss, i.e., having local mechanisms in place to identify all patients where discussion at MDM is needed</td>
<td>• Organizational support (e.g., funding and resources)</td>
</tr>
<tr>
<td>• Attendance of MDMs</td>
<td>• Availability of technology and equipment</td>
<td>• Organization during meetings</td>
<td>• Organization during meetings</td>
<td>• Patient-centered care (e.g., patient’s views and preferences are presented by someone who has met the patient, and the patient is given sufficient information to make a well-informed decision on their treatment and care)</td>
<td>• Data collection during team meetings, analysis, and audit of outcomes (e.g., patient experience surveys); the results of these investigations are fed back to MDTs to support learning and development</td>
</tr>
<tr>
<td>• Leadership (e.g., chair or leader of the MDMs)</td>
<td></td>
<td></td>
<td>• Post-meeting coordination of services for the patient</td>
<td>• Clinical decision-making process</td>
<td>• Clinical governance (e.g., there are agreed policies, guidelines, and protocols for MDTs; performance assessment and peer review against similar MDTs using cancer peer review processes and other tools)</td>
</tr>
<tr>
<td>• Team working and culture (e.g., mutual respect and trust, equality, resolution of conflict, constructive discussion, absence of personal agendas, ability to request, and provide clarification)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Personal development and training</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1 A list of instruments used to assess and improve MDT working

<table>
<thead>
<tr>
<th>Instrument (authors or source)</th>
<th>Brief instrument description</th>
<th>Instrument methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDT-OARS (Taylor et al24)</td>
<td>“The MDT Observational Assessment Rating Scale” assesses 18 elements of good team functioning as expressed in national UK guidance</td>
<td>Observation</td>
</tr>
<tr>
<td>TEAM (Taylor et al27)</td>
<td>“The Team Evaluation and Assessment Measure” assesses core functions of the team and their team meetings, based on the components defined in “the characteristics of effective MDT”</td>
<td>Team self-assessment</td>
</tr>
<tr>
<td>MDT-QuiC (Lamb et al40)</td>
<td>“The MDT Quality Improvement Checklist” is designed to aid decision-making in MDMs by ensuring that all aspects of a case are reviewed by the team</td>
<td>Checklist</td>
</tr>
<tr>
<td>MDT-MODe (Lamb et al40)</td>
<td>“The MDT Metric of Decision-Making” measures the quality of presented patient information, contribution to case review per specialty, and team ability to reach a decision in the team meeting</td>
<td>Observation</td>
</tr>
<tr>
<td>MDT Quality Improvement Bundle (Lamb et al27)</td>
<td>A team improvement bundle including checklist application, team skills brief training, and guidance implementation</td>
<td>Quality improvement bundle</td>
</tr>
<tr>
<td>MDT-MOT (Harris et al48)</td>
<td>“The MDT – Meeting Observational Tool” assesses team attendance, leadership/chairing of the MDM, teamwork and culture</td>
<td>Observation</td>
</tr>
<tr>
<td>MDT-FIT (<a href="http://www.mdtfit.co.uk66">www.mdtfit.co.uk66</a>)</td>
<td>“The MDT Feedback for improving Team working” encompassing validated components of MDT-MOT and TEAM allows self-assessment of team working, combined with expert feedback from facilitator, and sharing of the outcome with the team as part of a team-reflective discussion</td>
<td>Team self-assessment and observation</td>
</tr>
</tbody>
</table>

Abbreviations: FIT, feedback for improving team-working; MDM, multidisciplinary team meeting; MDT, multidisciplinary team; MODe, metric of decision-making; MOT, meeting observational tool; OARS, Observational Assessment Rating Scale; TEAM, Team Evaluation and Assessment Measure.

Abbreviations: MDM, multidisciplinary team meeting; MDT, multidisciplinary team; NICE, National Institute for Health and Care Excellence.
This definition was based on data from a national survey of over 2000 MDT members’ perceptions of effective MDT working. Responses showed that 90% of respondents were in agreement that an effective MDM results in improved clinical decision-making, more coordinated patient care, improvement in overall quality of care, more evidence-based treatment decisions, and improved treatment. NCAT recommended assessing areas of team meetings such as team working and leadership. Key performance indicators have subsequently been generated from the NCAT document to serve as a benchmark against which MDTs can appraise and develop their practice.23

Moreover, the responses from the NCAT national survey were further analyzed by Lamb et al.15 They revealed high agreement between different cancer teams (116 out of 136 agreements) in terms of what constitutes effective MDT working. Nonetheless, subtle variations in team working and clinical decision-making were evident across different tumor types and in relation to the preparation for and organization of MDMs, case selection, and clinical decision-making process.15

The “characteristics of an effective MDT” were further examined a few years later by Taylor et al49 while developing a series of teamwork formative assessment tools: MDT MOT, TEAM, and MDT FIT (Table 1). When testing these tools, Taylor et al confirmed the robustness of the characteristics as a benchmark that was applicable to rarer cancers (such as pediatric, brain, and hematology) in teams that faced challenges or complex situations and in MDMs that video-conferenced using multiple sites.49,24

More recently in 2017, a Cancer research UK report on cancer MDTs reiterated that team members expressed a high regard for MDMs, their structure, and process.25 The majority of participants valued the meetings stating that they not only facilitated patient care but also saved them considerable time elsewhere in their clinical or administrative practice.

Factors that are known to affect team processes

A number of studies have explored factors that have an impact on how well cancer MDMs function; these are related to the “input” element of the input-process-output diagram presented in Figure 1. Research into their working was greatly advanced by Lamb et al who developed a systems approach in 2010 to understand the multiple factors that can affect MDMs (Figure 2).26 This ordered structure was then used as a basis for assessing the efficient functioning of an MDM and designing assessment tools for MDMs to improve team working and the delivery of cancer care (Table 1). They also performed content analysis on the responses to free-text (open) questions pertaining to the effectiveness of MDM working from the 2009 national survey of MDT members in the UK.27 These questions covered three topics: effective team-working in the meetings, efficacy of team decision-making, and patient centeredness. This analysis aimed to further define aspects of effective team working in MDMs, with an emphasis on the similarities and differences in views between different professional groups.

The authors raised specific questions/issues regarding MDM functioning that could provide an evidence base

Figure 2. A systems approach to describe and evaluate the functioning of an MDM. Reprinted from Surgical Oncology. 2011;20(3):163–168. Lamb BW, Green JSA, Vincent C, Sevdalis N. Decision making in surgical oncology with permission from Elsevier.26

Abbreviations: GP, General Practitioner; MDM, multidisciplinary team meeting; MDT, multidisciplinary team.
on which MDTs can develop their practice. Specific areas highlighted included the following: 1) how best to represent patients’ views in MDM, 2) how disagreements within the team should be dealt with, and 3) what are the factors that facilitate participation in the decision-making process in team meetings, including organizational (e.g., lack of time to prepare) and interpersonal factors (e.g., steep hierarchies and lack of trust or respect between team members). It is argued that failure to optimize these factors can have an effect on clinical decision-making and could account for the variability seen in how well MDMs work.

Another contribution to our understanding of the factors that affect the impact of cancer MDTs on patient care comes from a systematic review8 performed on 37 studies published between 2000 and 2008. It was found that MDTs failed to reach a decision for 27%–52% of cases and that when decisions were made they could not be implemented in 1%–16% of cases. The study showed that 1) care management decisions are made predominantly by medical personnel (usually surgeons), while nursing personnel have less of an active role in decision-making and defining treatment options, and patient preferences are rarely discussed and 2) time pressure (including lack of protected time to prepare for meetings), excessive caseload, poor attendance, poor team working, and lack of leadership lead to lack of information and deterioration of decision-making. Some of these factors were reiterated in the 2017 Cancer Research UK (CRUK) report (time pressure, expanding workload, and lack of protected time) nearly 10 years later.23

In what follows, we describe in detail the factors affecting MDT working, including factors that impact on MDMs as per “input” in Figure 1.

Personal and team skills
Good relationships between team members and adequate non-technical skills are important for smooth effective MDT functioning (i.e., communication and leadership). In particular, communicating effectively with colleagues at various levels of hierarchy and managing conflict within teams are recognized as key contributors to safe, high-quality care delivery across specialities.21 However, evidence shows unequal participation in discussions on treatment options with medical personnel (including, e.g., oncologists and surgeons) tending to base their care management decisions primarily on biomedical information, seldom considering patient choice. It was also shown that nurses contribute to the meetings with the information about the patient’s views and psychosocial aspects of care, although traditional professional hierarchies often lead to the exclusion of nurses and bias toward biomedical information.8,27 An interview study exploring the views of surgeons, oncologists, nurses, and administrators on various characteristics of MDMs has found that patient discussions do not encompass the contributions of different disciplines equally, i.e., nurses are underrepresented and surgeons, who dominate discussion, are biased toward biomedical information.

Effective leadership of an MDT, which includes chairing of team meetings, can play an important role in ensuring equality and inclusiveness of participation that may enable better decision-making. Nontechnical skills (e.g., communication skills) as well as clinical expertise were cited as key characteristics of an effective meeting chair. Training in nontechnical skills may be of benefit, in particular because the chair does not necessarily need to be a surgeon since other core members with adequate skill could take on this role.28 Some of the best MDMs observed during the development phase of the MDM assessment tools mentioned earlier (Table 1) were chaired by specialist cancer nurses—core team members in MDMs.

When nurses are actively involved in care planning in the meetings, the team is perceived as performing at a higher level. Similarly, teams report that presence of nursing staff and larger and more diverse teams is associated with increased effectiveness.8,29 Nurses tend to involve patients’ views in the decision-making process more than medical personnel do. This is important since only 4% of MDM discussions involve patient’s holistic information directly in the decision-making process.29 In addition, evidence shows that decisions that take into account patients’ preferences, performance status, and comorbidities are more likely to be implemented since such decisions are more clinically appropriate and acceptable to patients.30,31,27 A more recent study showed that a complete patient profile (including, the biomedical aspects of the disease, as well as the information on patients’ co-morbidities, their psychosocial aspects, and views on treatment options), and input into the discussion by all core disciplines (including, the nurses’) are essential for the team to formulate a treatment recommendation for a patient.18,32 And the need for a higher level information on patient comorbidities and nursing input may actually be indicators of more complex discussions19 and validates the inclusion of specialist cancer nurses in the core membership of the MDMs.

The coordinators in cancer MDMs (for systems that afford this role within the team) also have an important role in improving the quality of care delivered by MDTs through their effect on team effectiveness and climate. However, their administrative role, as an intrinsic part of the cancer team, is often undervalued. The job is often used as an initial entry
into working in the health system and many of the coordinators, therefore, have little previous health service experience. A survey has found that coordinators feel that their job plan does not reflect their actual duties. They identified needs for further areas of training in oncology, anatomy, physiology, and leadership skills to improve their team performance and consequently cancer care. Their role is central to the care of patients, both locally and through the coordination and sharing of data on wider level. Since coordinators role is pivotal in MDMs, it is important to devise and provide them with adequate training in order to improve team performance as a whole, something further research could focus on.

Another issue raised by Lamb et al was the importance of recording the disagreements when they occur and potentially discussing them with the patient. Although disagreements are uncommon in MDMs, dissent is not detrimental to a team as it can enhance critical thinking and evaluation during decision-making. However, teams that do not tend to dissent are at risk of “group think”, where disagreement exists but are not openly expressed; this may indicate poor team climate and lack of open communication within a team that can lead to poor decision-making. Within an MDM, ensuring open communication where dissent is acknowledged and effectively managed may be a key element of the chair’s role. Further research is nonetheless needed to evaluate how often and where dissent occurs in meetings and how it should be managed and collated and how it should be communicated to the patient.

Team members report that MDMs are generally highly positive with an open culture for discussion, optimal management plans, coordinated treatment, and low risk of error. Moreover, a rotating leadership, which refers to team members taking turns at chairing the meeting, was found to be highly effective in terms of improving team work and morale and reducing inter-professional conflict, although MDMs are most commonly led by surgeons. However, the role of the chair is unequally (and irregularly) distributed across disciplinary groups within a MDM, although, disciplines other than surgeons may be able to undertake this role.

To illustrate this fact, a recent study from Scotland, examining the efficacy of a specialist nurse leading a cancer MDT by comparing clinical outcomes, showed that the nurse-led MDT performed as well if not better than other local units with comparable resources and patient population led by surgeons. Other disciplines such as oncology have high levels of contribution to MDM decision-making. But regarding their role in leadership, when surveyed, they thought that they could chair the team meeting as readily as any other professional group. However, they are not taking leadership role at the level that they expect; for example, only one in four oncologists has been chair of the MDT they attend and <40% of the MDMs they attend have a rotating chairman, further reducing the opportunity to lead. This prospect is further complicated by the finding that the oncologists who responded tend to participate in at least three MDMs, placing more demand on their time and ability to prepare and attend.

It may, therefore, be useful to have a clinically non-contributing member chair the meeting to avoid detriments in performance as a result of a dual-task interference, as the job of chairing the meeting, by a clinician, has the potential to diminish the contribution that the clinician can then make to decision-making, during the meeting.

Environment
While non-technical skills are important, they are not sufficient on their own. Support at an organizational level is also important in the form of protected time for the participants’ job plans to prepare for, attend, and take action on the workload of the meeting. Lamb et al found that lack of protected time for team meetings and competing demands or frequent conflicts with other responsibilities were barriers to effective meetings. In particular, team members without protected time for meetings were less likely to attend and that the most frequently cited organizational improvement to MDT working was more time dedicated to prepare for and attend the MDM. Further research or audit is needed at an organizational level to ensure that protected time is available and supported organizationally.

Excessive time pressure and lack of, or inadequate, information available at the time of decision-making (including imaging, investigations of tumor stage, review of pathology, and comorbidities) was found to negatively affect team ability to reach definitive care management plan, and lower team morale, resulting in reduced attendance and rushed decision-making. Compounding this, lack of protected time for MDMs to prepare for meeting contributes to excessive workload, time wasting during meetings, and inefficiency.

Technology and decision support systems also play an important role. Telemedicine improves meeting attendance and it is cost-effective. However, it can slow down the team by reducing the number of patient discussed per meeting and can negatively affect team’s decision-making.

Patient
Lack of patient-centered information presents a barrier to decision-making too; that is, failure to consider such information inhibits decision-making, renders decisions clinically inappropriate or unacceptable to patients, and is therefore detrimental to patient care. Patients should be represented...
Table 3 A list of factors impacting and improving decision-making and implementation

I. Factors impacting decision-making and implementation

- Lack of necessary information
- Lack of considerations of patient comorbidities, choices, and disease progression
- Non-attendance of key team members (as this can delay the decision and/or making a decision without the key team member can lead to an inappropriate treatment plan)
- Time pressure, i.e., not enough time to discuss all the patients, and so some get deferred (this can also negatively impact the patients)
- Technological problems with video conferencing

II. Factors improving decision-making and implementation

- Better case preparation, e.g., with a pro forma
- Effective team leadership (and chairing)
- Involvement of an anesthetist in the MDM (to immediately discuss whether patient is fit for surgery)
- Not discussing all patients, i.e., refining the inclusion criteria for MDT discussion either by splitting MDM into smaller meetings (logistical difficulties with this approach) or by excluding patients that fall under clear protocol/guidelines (although outside mandatory practice, this should be considered in future)
- Inclusion of patients in MDMs – however, there are mixed findings as to the benefit to the patient, and due to practical difficulties, patients in the UK do not attend

Abbreviations: MDM, multidisciplinary team meeting; MDT, multidisciplinary team.

by team members who know them well. Findings suggest that the clinical nurse specialist is the preferred team member to represent the patients’ views in meetings, but consultant and attending surgeon or other members could also share the duty. Having patients present in MDMs might arguably inhibit the process; hence discussions between the patient and team members following the main MDT discussion may be preferable.27 Nonetheless, patient-centeredness is important; a more recent study showed that patient psychosocial information is a significant predictor of team ability to reach a decision18 and that a complete patient profile is needed for information is a significant predictor of team ability to reach a decision32 and that a complete patient profile is needed for

Assessment of cancer MDT working

Studies show that MDM’s decision-making ability and the success in reaching a treatment plan when first reviewing a patient are good markers of the quality of teamworking.16,8,34,36 Teams’ choice of treatment and the implementation of these recommendations (rather than survival rates which are difficult to directly attribute to MDM working) can also be measured. Hence, a number of observational assessment tools have been designed to help measure and subsequently improve the impact of cancer MDMs on patient care. As such, observational approaches to MDM working are useful, feasible, and non-intrusive (i.e., do not intrude on patient time or add to team workload), providing an opportunity to perform out assessments in real-life setting and understand areas in which the MDMs are doing particularly well and those that need further improvement. Such approaches were developed on the backdrop of a growing tradition within health care for the use of observational evaluations of team skills and performance in both clinical environments, e.g., operating theaters,37 intensive care units,38 emergency departments,39 and within simulated settings.40 Overall, this is based on the premise that team assessment and feedback can help teams reflect on their own performance and improve their working.

However, observational methodology has its drawbacks. For example, it can be time consuming, lacks insight into and gastrointestinal tumors. It was found that 92% of patient management plans are formed at MDMs and 95% of these are subsequently implemented. The list of factors impacting decision-making and implementation and those that can help improve it are given in Table 3.
what participants think or feel, lacks control over extraneous factors, can present with limited replicability, and poses a challenge for a researcher to be accepted (non-clinical researcher) or to distance themselves from the environment (clinical researcher). Using structured and validated observation instruments by trained observers and ensuring good interobserver reliability can help adequately address these drawbacks. This is important, because, on balance, observation of MDTs is an important methodological approach to study such complex organizational behavior and to help improve safety and quality. Table 1 presents a list and description of tools designed and used for assessing MDTs together with study examples.

In the past few years, numerous studies have been performed applying observational techniques to better understand, assess, and improve MDT working. A number of studies have used a validated observational tool, MDT-MODe (Metric for the Observation of Decision-making in cancer multidisciplinary teams), to assess decision-making processes across different specialties, including the breast, urology, lung and colorectal cancers.\textsuperscript{18,32,41,42,44–47} For instance, Lamb et al\textsuperscript{42} revealed that the ability of an MDT to reach a clinical decision was positively associated with high-quality comprehensive and necessary information available at the point of decision-making (from case history, radiology, pathology), team contribution, and cases that are discussed at the beginning of meetings. However, high-quality information and team contribution were positively correlated with the larger team size, higher number of cases per meeting, and longer case discussions. Furthermore, using MDT-MODe, Soukup et al\textsuperscript{18,22} found that a complete patient profile and representation by all core disciplines are necessary to maximize the ability of an MDM to reach management recommendations for all cases. More recently, MDT FIT has been developed as a web-based self-assessment tool for use by UK cancer teams to assess themselves locally and regionally by using validated instruments such as MDT-MOT\textsuperscript{48} and TEAM\textsuperscript{49} embedded within them (Table 1).

In addition, there are developed and validated instruments within the social sciences that, although have not been specifically developed for cancer MDMs, could be profitably used in this context. For instance, the Team Climate Inventory,\textsuperscript{46} a short questionnaire, can provide insight into individual members’ perspectives of their team dynamics and has been successfully used with cancer MDTs.\textsuperscript{17} Bales Interaction Process Analysis\textsuperscript{87} is an observational coding system developed with small groups engaged in a problem-solving task (a context that resembles MDMs). It measures socioemotional (e.g., showing solidarity or tension) and task-related areas (e.g., giving suggestions and asking for opinion), and it has been successfully used as an observational assessment tool with MDTs.\textsuperscript{50–54} Team interactions can also be assessed using conversation analysis, which allows detailed examination of communication between members from audio- or video-recorded data transcribed using Jefferson notation system\textsuperscript{55} that captures not only what is said but also how it was said with symbols indicating various aspects of talk, including intonation, pauses, overlaps, gaps, pace, loudness, and cut-offs, for instance. It has been previously used to study MDTs in the context of weekly meetings,\textsuperscript{56,57} as well as in the operating theater.\textsuperscript{58,59} Overall, these are untapped translational resources that could be profitably used to gain better understanding of team processes and dynamics and allow effective assessment of different levels of MDT working.

**Improvement of cancer MDT working and its impact on patient care**

Some of the assessment tools described earlier has been used in intervention packages. For instance, Lamb et al\textsuperscript{42} performed an intervention study that encompassed the following: 1) half-day training session on the evidence for improved clinical decision-making followed by an interactive workshop and discussion, 2) MDT QuIC to support decision-making, 3) training session for surgical residents on how to use MDT QuIC to prepare and structure cases in advance of the team meeting, and 4) guidance to the team by providing hardcopy and via e-mail setting out how team members could draw optimal clinical information required for decision-making. These interventions were found to improve decision-making and the likelihood of the team formulating a clinical management plan, both necessary for high-quality patient care. Decision support tools, such as the MDT-QuIC, were also shown to improve patient care and increase compliance with clinical practice guidelines. MDT FIT, a self-assessment tool mentioned earlier, was also designed to be an intervention to improve cancer team working and thus ultimately the delivery of enhanced patient care. Since its inception, it has proven useful to all UK cancer teams that have used it and everyone has found areas for improvement.\textsuperscript{60}

Based on the flourishing area of team assessment and improvement tools that have been developed and applied in the past few years, we are optimistic that interventions that combine best evidence as found elsewhere in health care, such as combinations of skills training and checklist application, possibly using simulation as a training approach\textsuperscript{61} will find their way into MDM improvement in the coming years.

Health services have changed significantly since MDTs were introduced 20 years ago. There has been a sustained
increase in the workload of MDTs as a result of growing number of patients to be discussed in MDMs, along with the complexities of an aging population and growing number of treatment options available. The increase in the demand for MDT working has not been matched by greater availability of resources, with only minor increases in capacity seen. One potential solution, which has been identified by researchers and policymakers alike, is to streamline MDM working to allow more straightforward cases to assign less discussion time. This strategy might allow more time and resources in MDMs for discussion of complex or rarer cases, where patients have unusual or multiple problems requiring a truly multidisciplinary approach. Combined with the initiatives to improve the quality of MDT working, such a strategy, could help optimize the MDT approach for those patients in need of it.

Summary
As a central part of the care pathway, cancer MDMs are a clinically valued resource allowing a diverse range of health care experts, necessary for an increasingly complex cancer care, to come together and discuss treatment options for patients. They are an expensive resource, however, and with an increase in the health and economic pressures, its value has been progressively placed under scientific scrutiny.

The past decade has thus seen research on cancer MDTs rapidly evolving. The lack of empirical evidence led to the NCAT’s characteristics of effective teams. This was followed by an array of studies examining various aspects of team functioning; they encompass observational approaches and tool developments, but also surveys and interviews assessing the team members’ and patients’ perspectives on MDTs. The importance of weekly MDMs for cancer MDTs was further reiterated recently in the report by the CRUK.

While evidence has consistently shown variations in team working and clinical decision-making across different cancers, we have learned that certain factors pertaining to personal and team skills, the environment and patient-centeredness can impact team functioning and decision-making (Tables 3 and 4). Hence the importance of a team-centered approach to improving cancer MDMs; led by a clinically feasible, observational methodology, and adequate training opportunities in non-technical skills.

What is more, we have also grown to think of MDMs as an input-process-output model. This provides a necessary framework that allows the design and execution of studies necessary for producing and accumulating the knowledge base, thereby steadily building our understanding of what practices MDTs should reinforce and avoid. Table 4 below presents a summary of these practices as mentioned within our review.

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<th>Table 4 Practices to implement (Dos) and those to avoid (Don’ts) when setting up MDT-driven cancer care</th>
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<tr>
<td><strong>Dos</strong></td>
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<td>Good relationships between team members</td>
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<td>Communicating effectively with colleagues</td>
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<td>Managing conflict within teams effectively</td>
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<td>Incorporating patient choice into decision-making</td>
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<td>Incorporate patient views on the treatment options into decision-making</td>
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<td>Incorporate patient psychosocial factors into decision-making</td>
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<td>Incorporate patient comorbidities into decision-making</td>
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<tr>
<td>Ensuring equality and inclusiveness of team participation, in particular nurses</td>
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<td>Rotating chairing duties within and between disciplines and, where possible, have a clinically non-contributing individual chair the meeting</td>
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Abbreviation: MDT, multidisciplinary team.

Strengths and limitations of the review
Regarding limitations, this review is a summary of current understanding – academic and clinical – of cancer MDT working; due to the heterogeneity of the studies, metrics, and outcomes we reviewed, a fully systematic review methodology was not feasible. Furthermore, in being inclusive of different designs and methods and adopting a descriptive approach, we did not assess the methodology and analyses undertaken within the studies that form the evidence for this review. Strengths of the review include that it offers a summary of a very disparate evidence base and it covers validated metrics for the evaluation of MDT work processes.

Conclusion
This review presents an up-to-date summary of the recent literature on the impact of cancer teams on the management of patients with cancer. We hope that this review will serve as a comprehensive reference document for health care professionals, patients, and their advocates, as well as those involved in the organization of cancer services, to enable them to critically evaluate and improve multidisciplinary team working in their own domain. MDTs are essential to
cancer care, and cancer MDMs are a particularly important part since they allow the team with a diverse range of clinical specialties to come together and formulate treatment recommendations for patients with suspected or confirmed cancer. A range of factors pertaining to teamwork, availability of patient information, leadership, meeting management, and workload can affect the impact of an MDM on patient care. Studies to date have demonstrated that measuring and improving MDM working is possible and that improvements in patient care can be achieved as a result.

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Disclosure
Nick Sevdalis is the Director of London Safety and Training Solutions Ltd, which provides patient safety and quality improvement skills training and advice on a consultancy basis to hospitals and training programs. James Green is a Director of Green Cross Medical Ltd that developed MDT FIT for use by National Health Service Cancer Teams in the UK. The authors report no other conflicts of interest in this work.

References


60. MDTFIT.co.uk [homepage on the Internet]. NCAT in collaboration with Green Cross Medical Ltd and the University of Surrey Clinical Informatics Research Group; ©2011–2017 [updated May 2, 2014; cited April 7, 2017]. Available from: http://mdftfit.co.uk/. Accessed April 7, 2017. [For further examples, please see also www.youtube.com/watch?v=8wB1I2eSJE).WE and www.youtube.com/watch?v=F0kdFbf2BQU].


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