





Physician-led in-hospital multidisciplinary team conferences with multiple medical specialities present - A scoping review

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Abstract

Introduction: Multidisciplinary Team Conferences (MDTs) are complex interventions in the modern healthcare system and they promote a model of coordinated patient care and management. However, MDTs within chronic diseases are poorly defined. Therefore, the aim of this scoping review was to summarise the current literature on physician-led in-hospital MDTs in chronic non-malignant diseases.

Method: Following the PRISMA-ScR guideline for scoping reviews, a search on MDT interventions in adult patients, with three or more medical specialties represented, was performed.

Results: We identified 2790 studies, from which 8 studies were included. The majority of studies were non-randomised and focused on a single disease entity such as infective endocarditis, atrial fibrillation, IgG4-related disease, or arterial and venous thrombosis. The main reason for referral was confirmation or establishment of a diagnosis, and the MDT members were primarily from medical specialties gathered especially for the MDT. Outcomes of the included studies were grouped into process indicators and outcome indicators. Process indicators included changes in diagnostic confirmation as well as therapeutic strategy and management. All studies reporting process indicators demonstrated significant changes before and after the MDT.

Conclusion: MDTs within chronic diseases appeared highly heterogeneous with respect to structure, reasons for referral, and choice of outcomes. While process indicators, such as change in diagnosis, and treatment management/plan seem improved, such have not been demonstrated through outcome indicators.

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Keywords

Multidisciplinary team conferences

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Introduction

Multidisciplinary team conferences (MDT) are an integrated approach in the modern healthcare system and serve as a forum for consultation among relevant healthcare professionals in a standardised setting. MDTs promote a model of coordinated patient care and management.^{1–3} An MDT brings together the expertise and skills of healthcare professionals, jointly, to manage, assess and plan care for individual patients with complex care needs. In most settings, healthcare practitioners from a variety of medical specialties participate in the MDT conferences, but professionals from family medicine, pharmacy, nurses and other relevant healthcare personnel may also be present.¹ In the oncological setting the MDT approach has been proven beneficial in fields, where management is complex and multifactorial, and thus now considered one of the cornerstones of patient-centered care.^{2,3} MDTs are complex interventions in the modern healthcare system,^{4–10} and the concept has been shown to have several benefits: It facilitates diagnostic decisions and is associated with improved clinical outcomes, overall survival, patient satisfaction, and quality of life, especially among patients with cancer.^{3,4,11} MDTs promote cooperation as well as educational and research endeavors for the healthcare professionals, and thus, contribute to their training and competence development.^{2,3} While the benefits of MDTs within oncological settings are reasonably well-described, MDTs within the domain of chronic non-malignant diseases are poorly described and evaluated. Previous studies describing MDTs as interventions have described the organisation and process outcomes, evidence-based treatment, quality assurance, multidisciplinary collaboration, communication with primary care practitioners, survival, quality of life, financial cost, and competence development.^{2–4,11–16} Most of these studies were non-physician-led studies or studies based on oncological or radiographical MDTs, as well as studies with the main purpose of establishing a diagnosis.¹⁷ In the recent years, however, MDTs have expanded to various fields, including internal medicine, palliative medicine as well as surgery. With an increasing burden and complexity of multimorbidity,¹⁸ the role of MDTs within the domain of chronic diseases is poorly substantiated and not satisfactorily defined. With this scoping review, we want to summarise the current literature on physician-led in-hospital MDTs within the domain of chronic non-malignant disease. In addition, we aim to illuminate the key elements, such as context, healthcare professional practice, patient

population, inclusion criteria, and types of outcomes, as well as the clinical impact of such conferences.

The review forms the basis for developing a physician-led in-hospital MDT in chronic non-malignant diseases.

Methods

This scoping review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-analysis Extension for Scoping Reviews (PRISMA-ScR).¹⁹

Eligibility criteria

The inclusion and exclusion criteria were defined prior to database searches. As the term “multidisciplinary” is not a standardised and well-defined concept or entity (ie. a MESH term in Pubmed or alike) within an internal medicine setting, we decided to include studies describing MDTs or MDT-like interventions in adult patients (≥ 18 years), where at least three different medical specialities were represented. We included randomised and non-randomised controlled trials as well as observational studies (retrospective or prospective).

We excluded studies describing joint outpatient clinics with only two specialities, such as combined diabetes-renal-clinics²⁰ or geriatric-renal assessments.²¹ We also excluded studies based on in-hospital interdisciplinary rounds and tumor-conferences, as well as non-physician-led MDTs.²² Furthermore, studies solely describing an initiative without presenting quantitative, or qualitative data or studies focusing on educational or self-management interventions, and studies exclusively focusing on establishing diagnoses of specific diseases were excluded. Paediatric MDTs were excluded as well. We excluded studies on oncology-, surgical-, radiographical-, or pathological-led MDTs as a consequence of our focus on physician-led internal medicine-based MDTs.

Information sources

In December 2021 (cutoff search date: 13.12.2021), we searched the three following databases from inception without language restrictions: MEDLINE PubMed, EMBASE, and the Cochrane Library. Abstracts were excluded. The final search results were exported into Covidence.²³

Search

Using the boolean operators, AND, OR and NOT, the key words “multidisciplinary team” combined with truncated forms of “meeting” or “conferences” excluding “oncology” and “cancer” were searched on Medline Pubmed. Similar searches were performed at the Cochrane Library and EMBASE respectively (for details see [Appendix](#)).

Selection of sources of evidence

Two independent reviewers (DPH and ZNE) participated in all phases of the selection process. Any disagreements between the two reviewers on study selection were resolved by consensus.

In order to increase the consistency of selecting sources of evidence, the two reviewers screened the first 25 publications, discussed the results, and amended the screening manual before screening the remaining publications.

The search was broad initially, only excluding oncology/cancer directly in the search strings. Titles and abstracts were screened based on the eligibility criteria mentioned above. Then, full texts were screened and included in the final selection, and finally we predefined using CoCites to screen the included studies for relevant studies, not captured in the search line.²⁴ CoCites is a tool that identifies related articles, based on co-citation, assuming that articles with a higher co-citation frequency are more likely to address the same specific topic as the query article (in this case, the included studies).²⁴

Data charting process and data items

We predefined four main themes of interest: 1) The type of patients referred to the MDT, 2) The reason for referral, 3) the MDT composition, and 4) The choice of outcomes and main findings of the included studies. One of the reviewers charted the data and all authors contributed after evaluating the included studies.

Results

Selection of sources of evidence

We identified 2790 studies from the three databases. After duplicates were removed (n=171), 2619 studies were screened against title and abstract. We excluded 2565 (98%) of these and assessed 54 studies for full-text eligibility. Of those, 48 were excluded due to either wrong interventions (n=23) (e.g. only one medical speciality, not described in the abstract), wrong study design (n=12) (e.g. an MDT-validated behavioral intervention in ward), wrong setting (n=12) (eg. bedside MDTs not described in the abstract), or ongoing study (n=1), thus including 6 studies.^{25–30} After

using CoCites on these 6 studies 2 further studies were found eligible for inclusion.^{31,32} This led to a total of 8 studies included in the scoping review^{25–32} ([Figure 1](#)).

The studies comprised a total of 1200 patients, and 25 health-care providers (17 physicians and 8 nurses).

Synthesis of results

For an overview of the results, please refer to [table 1](#).

Types of studies included. The majority of studies were non-randomised studies (n=7),^{25–31} and one was a non-inferiority randomised clinical trial.³² One study reported both quantitative and qualitative data,²⁵ and one study was exclusively qualitative.²⁸ Two studies presented patient-reported outcomes, either as semi-structured interviews or surveys.^{25,31}

MDT composition. The MDT members were primarily from medical specialties gathered especially for the MDT. An overview of included medical specialties is shown in [table 1](#).

One study had a core group, where visiting specialites could differ,²⁹ another study did not predefine the MDT group members as they were selected depending on the patient at hand.²⁵

Types of patients referred. The majority of studies focused on a single disease entity such as infective endocarditis,^{26,30} atrial fibrillation,^{27, 24} IgG4-related disease,²⁹ or arterial and venous thrombosis,³¹ whereas other studies focused on patients with a predefined combination of diseases (kidney, diabetes, cardiovascular).^{28,32} One study did not predefine the type of disease, but instead “patients with complex medical conditions”²⁵ were included.

Reasons for referral. The main reasons for referral to the MDT were: Confirmation or establishment of a diagnosis,^{25,26,30} assessment and management of a treatment plan or strategy.^{25–27,29,31} Other studies included all patients admitted to a hospital department with a specific disease.³⁰

The choice of outcomes, and main findings. The choice of outcomes were grouped into process indicators and outcome indicators. The process indicators included changes in diagnostic confirmation,^{26,27,29,31} as well as therapeutic strategy and management.^{26,27,29,30} All studies reporting process indicators demonstrated significant changes before and after the MDT ([Table 1](#)). The outcome indicators were composite measures of complications rates (e.g. unexpected or prolonged critical care admission or renal replacement therapy in relation to the main disease),³⁰ morbidity (newly emerged diseases in relation to the main disease),^{30,32} and/or hospitalisation rates.³² The two studies including outcome indicators found no statistically significant changes.^{30,32}

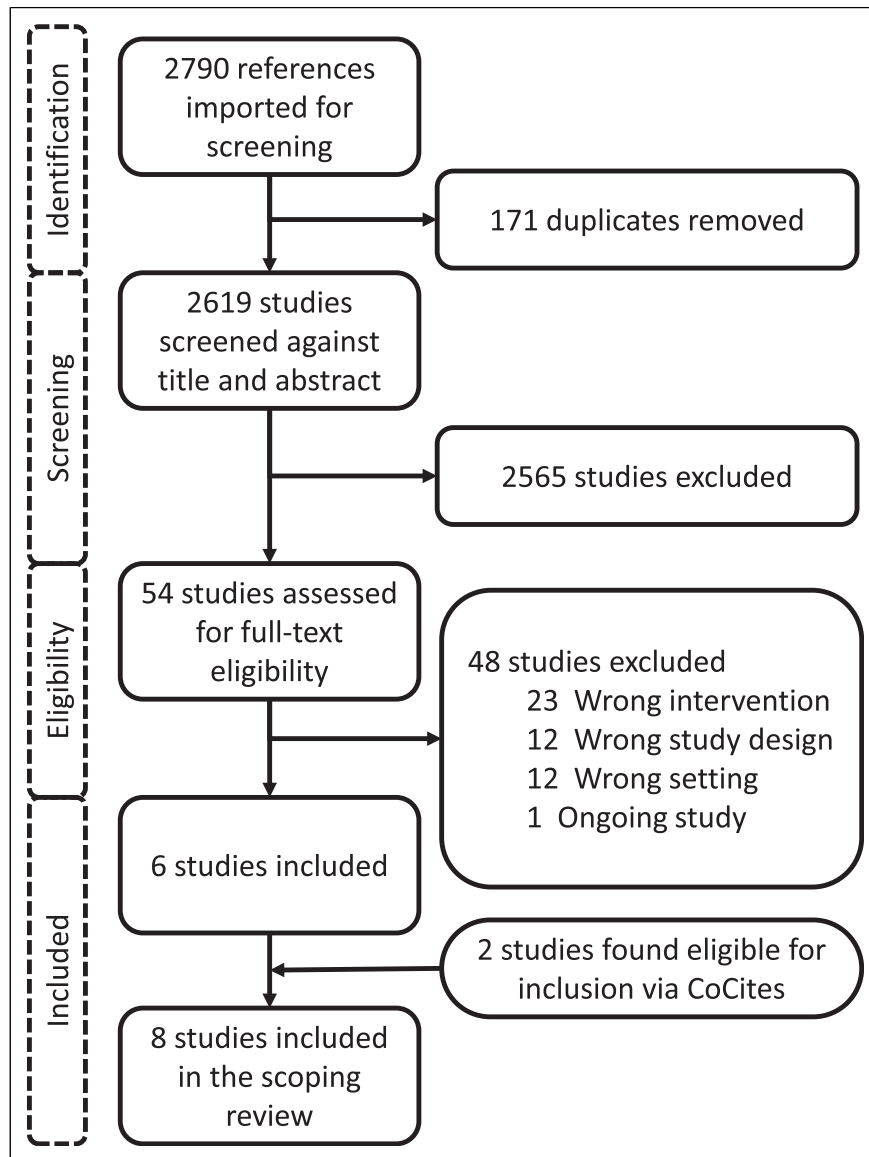


Figure 1. The PRISMA flow diagram for studies included in the scoping review.

Qualitative indicators included overall clinical satisfaction,²⁵ clinicians understanding of person-centered care, and alignment of clinical practice with theoretical understanding.²⁸ Patients accentuated the coordination as positive sides of the MDT,²⁵ emphasised a coordinated care plan, mutually agreed upon plan by their specialists, emphasised less blood work, and most importantly, less time attending different multiple specialist clinics; all while achieving the same clinical outcomes.³²

Discussion

In this scoping review on physician-led in-hospital MDTs with multiple medical specialties represented, we identified

8 studies including at total of 1200 patients. Our findings showed a pronounced heterogeneity in the MDT structure, reasons for referral, and choice of outcomes.

Despite the heterogeneity, some trends were observed. The reasons for referral were multifaceted, but most often due to a need for confirmation or establishment of a diagnosis or assessment and management of a treatment plan or strategy. This is in line with MDTs in other settings, such as in oncology and cancer care.¹⁵

What surprised us was the approach of some of the studies in regards to the MDT composition. Although the majority of the included studies reported fixed/standing MDT-members, one study reported that the MDT was assembled dependent on the patient at hand.²³ The benefits of

Table 1. Details of the included studies in the scoping review.

Study	Type of study	Number of participants	Setting	Study period	MDT composition	Who could be referred	Reason for referral	Choice of outcomes	Findings
Aston et al., 2018 ²⁵	Descriptive pilot study (both quantitative and qualitative)	-5 patients gave patient feedback)-9 clinicians	Tertiary hospitals	June 2016 to June 2017	Dependent of the patient at hand	Patients with complex medical conditions	-Lacked a confirmed diagnosis and treatment plan- Required a coordinated plan for investigation- Discharge planning of follow-up- Complex diagnostic or therapeutic dilemma	-Clinician feedback, -Patient feedback	-Clinicians: overall satisfaction with the MDT setup.-Patients: accentuated the coordination and positive sides of the MDT
Camou et al., 2019 ²⁶	Prospective follow-up study	-493 patients	Teaching hospitals, regional hospitals and clinics	January 2013 to June 2017	Cardiologists, infectious disease specialists, cardiac surgeons, microbiologist, imaging specialists and ICU specialists	Patients with infective endocarditis	-Diagnostic confirmation of cases-Proposal of a therapeutic strategy- prospective follow-up	-Confirmation or rule-out of diagnosis- Change in anti-infective treatment	-30% of "undocumented" cases were ruled-out- 90% of all anti-infective treatments were modified or adjusted
Chahal et al., 2019 ²⁷	Non-randomised intervention	-154 patients discussed at the MDT meeting	Primary care and local national health service hospitals.	April 2016 to April 2017	Cardiologist, haematologist, general practitioner, clinical pharmacist	Complex patients with atrial fibrillation	-Optimisation of therapy- Complexity of patients	-Four possible outcomes from the MDTs were used: atrial fibrillation resolved, exception report where the risk of anticoagulation outweighed the benefit, anticoagulate, further investigation required	AF resolved n=61 (40%), exception report n=30 (19%), anticoagulated n=16 (10%), further investigation required n=47 (31%).
Evén et al., 2019 ²⁸	Qualitative study	-31 patients -8 physicians -8 nurses	University hospital	February 2016 to October 2016	Endocrinologists, nephrologists, cardiologists	Patients with combined cardiovascular disease, impaired kidney function, and diabetes.	-The paper does not state the reason for referral other than the patients had a combination of cardiovascular disease, impaired kidney disease, and diabetes.	Semistructured interviews.-Clinicians understanding of person-centered care, clinical practice aligned with theoretical understanding	-Themes in the interviews: Who is the patient sitting in front of me?, "Patient capability and desire", "transformed healthcare professional roles during the interviews", "transformed meetings", "healthcare professionals as coaches", and "engaging relatives"

(continued)

Table 1. (continued)

Study	Type of study	Number of participants	Setting	Study period	MDT composition	Who could be referred	Reason for referral	Choice of outcomes	Findings
Goodchild et al., 2020 ²⁹	Prospective follow-up study	-156 patients	Two tertiary hospitals	2016 to 2019	Radiologists, histopathologists, gastroenterologists/hepatologists, rheumatologists, and general physicians with an interest in the disease. Visiting specialists included from a wide range of medical specialties	Patients with possible IgG4-RD.	-Establishing a diagnosis-Agreeing on a management plan-Assessment of treatment response and disease course- Recruitment of patients into clinical and translational research	-Establishing a diagnosis-Agreement of management plan	-62% were given a diagnosis 38% did not meet diagnostic criteria-Management changed in 74% of all patients. Primarily treatment escalation
Tan et al., 2018 ³⁰	Quasi-experimental before-and after study	-80 patients	Tertiary hospital	October 2013 to November 2017	Cardiologists, cardiac surgeons, critical care physicians, infectious disease specialists, neurologists	Patients with infective endocarditis	-All patients admitted with a definitive diagnosis of infective endocarditis or a probable diagnosis with strong clinical suspicion were referred	-Primary outcome: Composite measure of complications that were new or worse from admission and assessed up to 90 days after hospital discharge-Secondary outcomes: mortality, readmission, relapse of infective endocarditis, total length of hospital stay	-No difference in complication rates (40.0% vs. 51.5%, p = 0.13)-No difference in mortality up to 90 days after hospital discharge (26.3% vs. 17.5%, p = 0.20).
Mauger et al., 2020 ³¹	Single center retrospective followup	-142 patients	University hospital	February 2015 to May 2017	Haemostasis, internal medicine, oncology, geriatric, vascular medicine and radiology	Patients with arterial and venous thrombosis	-Diagnostic and therapeutic management- Indication of therapy-Duration of therapy	-Three main categories of therapeutic decisions were made: type-, choice-, and duration of anticoagulation	-Significant difference between the initial treatment and the one suggested in the MDT meetings, and a significant difference in the duration of anticoagulation. No significant difference between the choice of anticoagulant before and after the MDT meeting

(continued)

Table 1. (continued)

Study	Type of study	Number of participants	Setting	Study period	MDT composition	Who could be referred	Reason for referral	Choice of outcomes	Findings
Weber et al. 2011 ³²	Non-inferiority RCT	-139 patients	Tertiary hospital	April 2005 to July 2005	Endocrinologists, nephrologists, cardiologists	Patients attending a kidney care clinic and at least one other speciality clinic of interest (diabetes or cardiovascular disease)	-Patients attending a kidney care clinic and at least one of the other specialities of interest: diabetes- or cardiovascular clinic were eligible for referral	-Primary outcome: Hospitalisation rates- Secondary outcomes: GP visits, achievement of target lab and clinical values, and symptoms as well as estimated costs- Patient perspectives- Cost analysis	-Hospitalisation rates were not different (95% CI for the difference:0.13-0.207; P = 0.03).- Similar proportions in each group achieved clinical and laboratory targets. -Mortality (13%) and dialysis (32%) rates were the same between groups. -Differences in the cost of clinic visits alone were \$86400 in favor of the combined clinic- Patients: perceived a coordinated care plan, mutually agreed upon plan by their specialists, less blood work and most importantly, they spend less time attending different multiple specialist clinics; all while achieving the same clinical outcomes.

this approach is the possibility of gathering the most competent physicians tailored to the need relevant to the specific patient problem. However, as the authors pointed out, the disadvantage of this approach is of more logistical character such as identifying and agreeing on a suitable date for the meeting and identifying a suitable clinician within each specialty to participate.

Some of the included studies reported a compromise, where the MDT consisted of predefined core members with the possibility of drawing in visiting specialists, depending on the patient at hand.^{29,31}

One of the included studies described the setup and logistics of the MDT as well as the coordination, conduction, and leadership of the meetings on a more “meta-level”²⁵. The authors emphasised that the referring clinicians restricted participation to essential members in order to facilitate timely scheduling, as well as a need for active engagement of the lead clinician in facilitating planning and running the MDT. Similar thoughts have also been reported in a palliative setting, using an ethnographic setup.³³ The authors of this study found that a predetermined structure, an agreed format, and prescribed timings help convey expectations ensuring that the meeting will not be overrun. Furthermore, the authors reported that the space where the meeting is held often matters more than may be realised. Other studies have presented determinants of treatment plan implementations in cancer- and chronic diseases MDT conferences reporting reduced likelihood of implementation with additional professional groups represented, and increased likelihood of implementation when a clear goal and process is present at the MDT.³⁴

The majority of the included studies in the current scoping review included patients with a single disease entity like infective endocarditis^{26,30} or single chronic disease like atrial fibrillation.²⁷ Multidisciplinary care is, however, widespread in other specific chronic medical diseases, like chronic kidney disease. A recent scoping review found a potential beneficial impact on patients with chronic kidney disease, but because of the heterogeneity of team compositions and processes with inadequate reporting, the authors found it difficult to determine which of the specific elements that were associated with improved patient outcomes.³⁵

Two of the included studies targeted multimorbid patients with a predefined combination of diabetes, kidney disease, and cardiovascular disease.^{28,32} Interestingly, multidisciplinary care clinics handling multimorbidity are emerging. The impact of patient-centered care for these patients with a combination of diabetes, renal, and cardiovascular disease is currently being evaluated in a randomised controlled setting.³⁶ One of the included studies in the present scoping review was based on the same patient population as mentioned above.²⁸

The initial findings of this trial showed no statistical significant differences in healthcare utilisation in a 6 month

period before and after the intervention. The authors emphasised the difficulties in obtaining significant clinical findings for patients with multiple chronic conditions in such a setup.³⁷

Overall, the findings in the included studies showed significant changes in the patients’ treatment-course in regards to diagnosis and medical treatment. However, only a few studies coupled these process indicators to outcome indicators like hospitalisation rates, morbidity, and mortality, showing no significant differences. These studies were, however, not designed to assess superiority.^{30,32}

These tendencies have been reported in oncology-based MDTs where the meetings have shown to have an impact on patient assessment and management practices. According to some authors, only little evidence indicates improvement in clinical outcomes.⁴ The authors call for future research assessing the impact on patient satisfaction and quality of life. Regarding patient satisfaction, this was addressed in two of the studies included in the present scoping review. In both studies, the patients were satisfied and accentuated the coordination as positive sides of the MDT.^{25,32}

We believe that MDT care for patients with multimorbidity without a predefined combination of diseases could positively impact the course of treatment, but the literature is scarce. MDTs for fixed disease combinations have, on the other hand, been found to change the course of treatment, but the effect of this change, is only sparsely reported.

Limitations

The main limitation was the lack of a standardised definition of MDT as a concept and consequently, a poorly defined search terminology. We wanted to explore the physician-led MDTs with multiple medical specialties present, and due to this, not all studies meeting our definition were necessarily captured by our search lines. We used CoCites to account for this limitation, which also increased the number of included studies by 25%.

The included studies were heterogeneous and could only be compared narratively. We chose to include studies describing physician-led MDT interventions, where three or more medical specialties were present, thus focusing more on the intervention and framework rather than specific combination of diseases. This could, likely, have excluded potentially relevant studies. Studies focusing on educational or self-management interventions, and studies exclusively focusing on establishing diagnoses of specific diseases were excluded, potentially impacting our results.

Conclusions

Within the domain of non-malignant disease, MDTs with more than two medical specialties represented appear highly

heterogeneous with respect to structure, reasons for referral, and choice of outcomes. While process indicators, such as change in diagnosis and treatment management/plan seem improved, this has not been demonstrated for outcome indicators. Conceptually MDTs are poorly defined as is the accompanying terminology. The effect with respect to outcome indicators is insufficiently substantiated. We suggest concerted international efforts be made to define MDTs for chronic non-malignant diseases with respect to concept and terminology with future research focusing on outcome indicators to justify the approach.

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Supplemental Material

Supplemental material for this article is available online.

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Appendix

MEDLINE

(multidisciplinary team AND (meeting* OR conference*)) NOT (oncology OR cancer) [All Fields]

Cochrane library

(multidisciplinary team AND (meeting* OR conference*)) NOT (oncology OR cancer)

All text, trials only

EMBASE

1. multidisciplinary team conference.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]
2. multidisciplinary team meeting.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]
3. (cancer or oncology).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]
4. (1 or 2) not 3