 Developing a Decision-making Model Based on an Interdisciplinary Oncological Care Group for the Management of Colorectal Cancer

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Abstract. Aim: To report our experience on implementation and preliminary results of a decision-making model based on the recommendations of an Interdisciplinary Oncological Care Group developed for the management of colorectal cancer. Patients and Methods: The multidisciplinary team identified a reference guideline using appraisal of guidelines for research and evaluation (AGREE) tool based on a sequential assessment of the guideline quality. Thereafter, internal guidelines with diagnostic and therapeutic management for early, locally advanced and metastatic colonic and rectal cancer were drafted; organizational aspects, responsibility matrices, protocol actions for each area of specialty involved and indicators for performing audits were also defined. Results: The National Institute for Health and Care Excellence (NICE) UK guideline was the reference for drafting the internal guideline document; from February to November 2013, 125 patients with colorectal cancer were discussed by and taken under the care of the Interdisciplinary Oncological Care Group. The first audit performed in December 2013 revealed optimal adherence to the internal guideline, mainly in terms of uniformity and accuracy of perioperative staging, coordination and timing of multi-modal therapies. To date, all patients under observation are within the diagnostic and therapeutic course, no patient came out from the multidisciplinary “path” and only in 14% of cases have the first recommendations proposed been changed. The selected indicators appear effective and reliable, while at the moment, it is not yet possible to assess the impact of the multidisciplinary team on clinical outcome. Conclusion: Although having a short observation period, our model seems capable of determining optimal uniformity of diagnostic and therapeutic management, to a high degree of patient satisfaction. A longer observation period is necessary in order to confirm these observations and for assessing the impact on clinical outcome.

Colorectal cancer (CRC) was the most frequent type of cancer in Italy in 2012, with over 54,000 new diagnoses in both sexes and a mortality rate of 11,035 per 100,000 and 8,582 per 100,000 persons in males and females, respectively (1).

Up to one-third of patients presenting with advanced disease at diagnosis and about 40% of those with early-stage disease experience relapse during the disease course (2). In the past 20 years, numerous studies have demonstrated the importance of accurate staging and combination therapy in achieving an optimal outcome, especially for those with advanced disease (3, 4). However, considerable variation still exists in cancer management and outcome across Institutions and a large variability is also evident between guidelines and patterns of cancer care in clinical practice (4).

The establishment of a multidisciplinary team (MDT) has become an increasingly popular approach over the past two decades. In this model, patient care is coordinated in a...
同步进行。多学科专家参与了决策过程，基于证据的治疗（5,6）。潜在优势包括增加临床结果、患者满意度和合规性，并为所有参与者提供了增强的教育经验，提高了纳入临床试验的可能性（6）。

然而，没有证据表明在这一方法下生存率受益。研究数量有限，一般为回顾性，且通过MDT比较结果（7-9）。因此，实施多学科计划和展示其有效性仍然具有挑战性。

本报告介绍我们在实施和初步结果决策制定模型基于证据-临床推理方法的基础上的经验。材料和方法

在CRC管理中，一个MDT的GICO被建立在奇维医院管理层的协调下。2012年9月至2013年1月期间，该组使用了来自多个学科的外科医生、放射学家、放射治疗师、肿瘤科医生、胃肠科医生、病理学家和急诊科医生。从9月2012年到1月2013年，该组所用的参考指南是在所有指南评估的基础上和本地指南定义的，不仅对医生而且对护士、技术人员和行政人员都有定义。

首先，从意大利肿瘤协会（AIOM）、欧洲肿瘤学会（ESMO）、国家医疗和护理卓越机构（NICE, UK）、苏格兰国家临床指南委员会（SIGN）和美国国家综合癌症网络（NCCN, USA）中选取了一个参考指南。从9月2012年到1月2013年，该组使用了以下方法来起草一个具有诊断和治疗指导的内文文件。

首先，一个参考指南是从AIOM、ESMO、NICE、SIGN和NCCN指南中选择的，根据证据和判断的强度对推荐的评估（10,11）。指南所选内容独立由四名不同的学科医生（外科医生、肿瘤科医生、放射治疗师和放射学专家）进行评分，每10年CRC经验。

该AGREE工具由23项组成，分为六个部分。每个区域都针对具体的质量的评估（表I）。一个4点利克特尺度用于评分每项（1=强烈不同意，2=不同意，3=同意，4=强烈同意）。一个3点尺度用于比较整体判断，是否指南应该被推荐使用（1=不推荐，2=推荐但有修正或修改，3=强烈推荐）。每个区域的评分通过平均和归一化各自区域的最终得分来计算。该结果由四名医生表明。

因此，该参考指南作为GICO文件的参考指南。由此，通过特定的附录来描述放射学、内镜学、手术学、病理学和放射学程序。这些流程的临床推理图解概括了整个工作，如图1所示。

从一个组织的角度来看，责任的每个学科都配备了专业护士，不仅对医生而且对护士、行政人员和行政人员。

完整的GICO文件可在官方网站上获得：www.asl2abruzzo.it，并包括所有治疗算法和附录的指南和具体方法。

一个关键作用是建立一个护理人员，一个高技能的护理人员谁需要照顾每个关系之间的物理和患者在预约、收集医疗测试和规划每一种类型的治疗性干预。一个护理人员遵循患者在每一步的诊断和治疗性过程，并针对所有活动的MDT。患者来到肠癌MDT通过护理人员的门面患者医疗服务（内镜学，放射学，放射治疗，肿瘤学），医院和医院紧急。

MDT每周在医院见面，并与一个大约两小时的肿瘤会议会面，讨论病例。该会议通常由结直肠外科医生、放射治疗师和医疗肿瘤科医生、放射科医生、放射科医生和护理人员参加。肿瘤会议委员会允许该集团复习研究图解，
discuss treatment alternatives, and determine the appropriate
diagnostic and therapeutic management, focusing on evidence-
based best practice guidelines from the GICO document.
Thereby, each patient comes to the hospital following the
Tumor Board discussion and has sequential appointments with
each specialist on the basis of the defined diagnostic and
therapeutic strategy.

Audits were scheduled annually, and in December 2013, the
Clinical Governance staff performed the first audit.
From February to November 2013, 125 cases of patients
with CRC, 97 with colonic cancer and 28 with rectal cancer,
were discussed and taken under the care of the GICO. A total
of 81/125 patients (65%) underwent staging work-up inside
the Hospital Radiology Department, while 44/125 patients
(35%) had already undergone radiological examinations
outside the hospital and, therefore, were then reviewed by
radiologists of the GICO. In both cases, a constant uniformity
of staging was reached. Moreover, all patients with rectal
cancer underwent integrated computed tomographic staging
with magnetic resonance imaging.

As a first therapeutic approach for colonic cancer, 69
patients were submitted to surgery, 21 to primary chem-
otherapy, and for 7 patients, a stent was endoscopically placed.
As a first therapeutic approach for rectal cancer, 14 patients
were submitted to neoadjuvant radiochemotherapy, 8 to
surgery and 6 patients to palliative radiotherapy.
Eighteen decisions were changed after GICO meeting: due
to comorbidities in 10 patients, new clinical information in 4
cases, and non-acceptance of the first therapeutic option
proposed in 4 cases.
Therefore, in 86% of cases, the first recommendations
proposed were complied with, while in 14% of cases, the first
recommendations proposed were changed but used alternative
treatment options expected from the GICO document.
To date, all patients under observation are within the
diagnostic/therapeutic course and no patient has come out
from the multidisciplinary “path”.
Although with a short MDT working period of only 10
months, all the selected indicators have been met. Moreover,
there was a high degree of patient satisfaction, but at the

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Table 1. Areas and items of the appraisal of guidelines for research and evaluation (AGREE) tool.

<table>
<thead>
<tr>
<th>Area 1: Scope and purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>The overall objective(s) of the guideline is (are) specifically described</td>
</tr>
<tr>
<td>The clinical question(s) covered by the guideline is (are) specifically described</td>
</tr>
<tr>
<td>The patients to whom the guideline is meant to apply are specifically described</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area 2: Stakeholder involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>The guideline development group includes individuals from all the relevant professional groups</td>
</tr>
<tr>
<td>The patients’ views and preferences have been sought</td>
</tr>
<tr>
<td>The target users of the guideline are clearly defined</td>
</tr>
<tr>
<td>The guideline has been piloted among end users</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area 3: Rigor of development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systematic methods were used to search for evidence</td>
</tr>
<tr>
<td>The criteria for selecting the evidence are clearly described</td>
</tr>
<tr>
<td>The methods for formulating the recommendations are clearly described</td>
</tr>
<tr>
<td>The health benefits, side-effects and risks have been considered in formulating the recommendations</td>
</tr>
<tr>
<td>There is an explicit link between the recommendations and the supporting evidence</td>
</tr>
<tr>
<td>The guideline has been externally reviewed by experts prior to its publication</td>
</tr>
<tr>
<td>A procedure for updating the guideline is provided</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Area 4: Clarity of presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>The recommendation are specific and unambiguous</td>
</tr>
<tr>
<td>The different options for management of the condition are clearly presented</td>
</tr>
<tr>
<td>Key recommendations are easily identifiable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area 5: Applicability</th>
</tr>
</thead>
<tbody>
<tr>
<td>The guideline is supported with tools for application</td>
</tr>
<tr>
<td>The potential organizational barriers in applying the recommendations have been discussed</td>
</tr>
<tr>
<td>The potential cost implications of applying the recommendations have been considered</td>
</tr>
<tr>
<td>The guideline presents key review criteria for monitoring or audit purposes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area 6: Editorial independence</th>
</tr>
</thead>
<tbody>
<tr>
<td>The guideline is editorially independent from the funding body</td>
</tr>
<tr>
<td>Conflicts of interest of members of the guideline development group have been recorded</td>
</tr>
</tbody>
</table>
moment, it is not possible to assess the impact of the MDT on clinical outcome due to the short duration of operation of the GICO.

**Discussion**

The rationale for the establishment of an MDT in cancer care is represented by the need for coordinated diagnostic and therapeutic management in which specialists from multiple disciplines are involved in a decision-making process based on evidence-based treatment.

Potential benefits include greater uniformity in management, increased clinical outcome, patient satisfaction and compliance, and an enhanced educational experience for all participants, with increased recruitment into clinical trials (6, 7, 8, 16).

CRC is also being increasingly managed in a multidisciplinary fashion as diagnostic technologies expand and the importance of carefully-timed multimodality therapy is recognized. However, there is little evidence to support the existence of any benefit with an MDT approach and, therefore, implementing a multidisciplinary program and demonstrating its effectiveness remains challenging.

Our experience of a decision-making model based on a GICO for management of CRC first selected the NICE guideline reference through AGREE, an instrument which provides an assessment for the validity of a guideline in terms of probability that it really reaches the desired objectives (15). To our knowledge this is the first experience on the application of this method to detect a reference guideline aimed at the preparation of a multidisciplinary internal report (the GICO document). However, the AGREE method has been extensively tested and was rated by users as appropriate, easy and helpful in differentiating guidelines of varying quality (11).

The preliminary results of our MDT put to work showed optimal adherence to the GICO document, mainly in terms of uniformity and accuracy of perioperative staging and re-

<table>
<thead>
<tr>
<th>Areas</th>
<th>NCCN</th>
<th>NICE</th>
<th>SIGN</th>
<th>ESMO</th>
<th>AIOM</th>
</tr>
</thead>
<tbody>
<tr>
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<td>86,66667</td>
<td>100</td>
<td>88,8889</td>
<td>35,5556</td>
<td>48,8889</td>
</tr>
<tr>
<td>Stakeholder involvement</td>
<td>80</td>
<td>85</td>
<td>78,3333</td>
<td>23,3333</td>
<td>36,6667</td>
</tr>
<tr>
<td>Rigour of development</td>
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<td>92,38095</td>
<td>72,38095</td>
<td>38,09524</td>
<td>35,2381</td>
</tr>
<tr>
<td>Clarity of presentation</td>
<td>90</td>
<td>81,6667</td>
<td>73,3333</td>
<td>46,6667</td>
<td>46,6667</td>
</tr>
<tr>
<td>Applicability</td>
<td>42,22222</td>
<td>71,11111</td>
<td>71,11111</td>
<td>4,444444</td>
<td>6,666667</td>
</tr>
<tr>
<td>Editorial independence</td>
<td>80</td>
<td>86,6667</td>
<td>86,6667</td>
<td>23,3333</td>
<td>6,666667</td>
</tr>
<tr>
<td>Average</td>
<td>76,8</td>
<td>86,1</td>
<td>78,4</td>
<td>28,6</td>
<td>30,1</td>
</tr>
</tbody>
</table>

staging, coordination and timing of multimodal therapies, while at present it is not possible to assess the impact of the MDT on clinical outcome due to the short time of GICO activity. In addition, to date, all patients are so far within the diagnostic/therapeutic course and none patient came out from the multidisciplinary “path”.

Levine and co-workers prospectively collecting data of patients with CRC diagnosis referred to an MDT, and comparing the results to a control group of patients managed outside an MDT using the NCCN guideline as reference, showed better results for patients referred to an MDT in terms of improved adherence to the NCCN guideline, preoperative work-up, synchronization of multimodal therapies, frequency of perioperative treatment and advanced pathology testing (17).

In a population-based study, Swellengrebel and co-workers evaluated the additional value of discussing patients with rectal cancer in an MDT compared to patients not discussed in an MDT, with the occurrence of a positive circumferential resection margin as the primary end-point. Additional aims were to audit preoperative and histopathological staging and...
treatment according to Dutch guidelines (18). Although no difference in the positive margin rate was found, clinical staging was more complete and a magnetic resonance imaging study was also performed more often in the MDT group; patients receiving preoperative chemoradiotherapy were also discussed more often by the MDT than those undergoing total mesorectal excision only and patients with distal tumors were more likely to be discussed by the MDT.

Overall, only half of the patients diagnosed with rectal cancer were discussed by an MDT (18). Ying-jiang and co-workers assessed the effect on management of CRC in two groups of patients stratified into those managed before and those after the introduction of the MDT (19). The accuracy of TNM staging by computed tomography and the number of examined lymph nodes in the MDT group were significantly more than those in pre-MDT group. The rate of tumor recurrence in the MDT group was lower than in the pre-MDT group and in multivariate analysis, the management after MDT was an important factor that independently influenced overall survival, together with age, degree of tumor differentiation, number of examined lymph nodes and TNM stage. The authors concluded that the MDT improved the diagnostic accuracy and overall survival of patients with CRC and promoted communication and cooperation between disciplines, ensuring high quality diagnosis, evidence-based decision-making and optimal treatment planning.

Maskell (20) and Taylor et al. (21) also claimed that from the introduction of MDTs in the UK, the main benefit was the greater accuracy of radiology from staging to restaging and follow-up.

Our audits are planned annually and the first audit performed in December 2013 seems to have proven the effectiveness of the selected indicators using a Delphi method and NICE guideline (14, 15). The timing of the audits and the effectiveness of the indicators used are recognized aspects of fundamental importance in assessing the quality of MDT working. In fact, performing an audit of the multidisciplinary diagnosis and treatment of patients with CRC from 2006 to 2008 to evaluate whether compliance with guidelines were improved, Van der Geest and co-workers used a limited set of quality indicators derived from the Netherlands evidence-based guidelines and selected with the Delphi method (22). The authors found a considerable improvement in the compliance with guideline recommendations for non-metastatic CRC and emphasized the key role of audit and indicators in identifying quality concerns and tracking changes over time, as was confirmed by Wood and co-workers (23).

In our GICO experience, the organizational aspects, planned with the responsibility matrices and the coordinating role of the Case Manager centralized on a highly skilled professional nurse, are proving to be crucial in maintaining the schedule of weekly meetings, in making available all clinical material useful for discussion, in defining appointments for patients and in treatment timing. Together with the expertise, constancy and routinary use, these issues could prove to be very important over time. Moreover, these issues could be a response to concerns highlighted by the survey of Sharma and co-workers, in which many surgeons and nurses consider that attendance at MDTs is not taken into account adequately in terms of career plans, and to concerns raised by Kane and Luz who, investigating MDT activity in November 2005 and in November 2012, have shown that work rhythms changed over time as a function of the volume of work and technological progress, and maintaining cohesive teamwork with roles and responsibilities is challenging in terms of time spent, organization, resources and updating the reference guideline (26, 27).

**Conclusion**

Coordination, communication and decision-making between healthcare team members and patients are aspects of cancer care that could be improved by MDT working. Implementing a multidisciplinary program and demonstrating its effectiveness in cancer care management remains challenging. Although with a short observation period, the methodology applied in implementing and checking organizational aspects and decision-making of our MDT model for CRC management led to a comprehensive adherence to the internal guideline produced, with an optimal uniformity of diagnostic and therapeutic management and a high degree of patient satisfaction.

A longer observation time is necessary for confirming these observations and for assessing the impact on clinical outcome.
References


