

## **Key effectiveness elements for multidisciplinary models of care in fatty liver disease**

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## Introduction

A model of care (MoC) provides a broad framework for delivery of health services along the continuum of care. Due to the high prevalence and multiple coexistent conditions, the management of fatty liver disease requires context-specific multidisciplinary MoCs. Primary care providers are essential for diagnosis and risk-stratification of those with probable fibrosis to identify patients who will benefit from further assessment, treatment and follow-up. Optimal care of the person with fatty liver disease integrates hepatology with disciplines that manage associated comorbidities, including endocrinology/diabetes, obesity medicine, nutrition, cardiology, bariatric surgery, endoscopy, physical therapy and mental health. Multidisciplinary MoCs help co-ordinate care, facilitate equity, streamline resources for efficient and effective use, and can improve patient outcomes by timely identification and intervention.

Several multidisciplinary MoCs have been implemented, but most have not reported measures of effectiveness and impact on healthcare costs, human resources, outcomes and experiences (Zonkape 2022). Drawing on published MoCs, an expert panel recently provided a framework of eight recommendations for the design and implementation of effective MoCs in NAFLD (Lazarus *NRGH* 2021). The recommendations are structured around four themes: (i) what services are required; (ii) who should provide them; (iii) where they should be provided; and (iv) how they will be integrated within healthcare systems. In this comment, we propose a list of key elements that should be reported when MoCs are assessed, because they are necessary for evaluating the MoC's efficiency, generalizability to health systems, and adoptability. They are organized around the four central components of the MoC structure: patient care, care pathway, performance, and healthcare system (**Figure 1**).

## Patient care

### *Definition of the population assessed*

MoCs designed to identify people with fatty liver disease, including those at risk for fibrosis, using non-invasive tests (NITs) should clearly specify the characteristics of the population in which the MoC is applied; general population versus risk factor-based criteria such as diabetes and obesity.

### *Objective of the assessment (what outcome is looked for)*

MoCs for risk-stratification should use NITs and cut-offs developed and validated for the fibrosis stage to be identified (e.g., clinically significant fibrosis, advanced fibrosis, or cirrhosis). As NIT evidence builds, it may be possible to define cut-offs based on clinical outcome prediction rather than by reference to histology. In addition, MoCs should include and report testing for metabolic parameters such as dyslipidemia, diabetes mellitus, and hypertension, to facilitate multidisciplinary care (McPherson, LGH 2022).

### *Patient reported outcomes and experiences*

MoCs used should measure and report their impact on patient-reported outcomes (PROs) and patient-reported experiences (PREs), to assess quality of care (McPherson et al). False positive diagnosis can lead to substantial impact on health-related quality of life due to anxiety or pain (as measured with PROs) or added waiting time for testing or specialty visits and even distrust in healthcare providers (as measured with PREs) if, for example, the second line NIT is discordant. On the other hand, knowledge of

fibrosis stage can induce motivation for lifestyle modification (Carrieri et al).

## **Care pathway**

### *The criteria for referral to primary and specialty care*

MoCs designed to identify patients who should be referred to primary care, hepatology and other disciplines such as diabetology, cardiology, or bariatric surgery should use clear evidence-based criteria for referral.

### *Definition of the standard-of-care pathway that the MoC is compared to*

Adoption of a new MoC is based on the premise that it improves delivery of care and health outcomes when compared to other models. To enhance generalizability and transferability between healthcare systems, the effectiveness of published MoCs should be compared to the standard-of-care or previously published models (Srivastava et al, Dillon et al, Neilson et al).

## **Performance**

### *Conventional performance parameters*

MoCs designed to identify individuals at risk of fibrosis or liver-related outcomes should report the area under the receiver operating curve and the sensitivity and specificity of the cut-offs used for the population being studied. The positive and negative predictive values should be calculated based on the prevalence of the outcome in the population studied and ideally modelled for different prevalence estimates to increase generalisability.

### *Downstream implications of performance of the care pathway*

To appreciate the broader impact of the MoC beyond conventional performance measures, studies should present practical performance metrics such as the number of new cases identified and of unnecessary referrals avoided, or the downstream implications of false positive cases on patients and healthcare systems.

### *Impact of MoC on long-term outcomes (hepatic and extrahepatic)*

Most MoCs report immediate outcomes such as the number of patients identified with fatty liver disease, at-risk NASH or cirrhosis, the number of patients at risk for cardiometabolic complications who need referral, or short-term changes such as weight loss. These are important but also require evidence of impact on hard outcomes such as cirrhosis, decompensation, liver cancer, major adverse cardiovascular events, and mortality. As MoCs are developed and implemented, it is crucial that the studies are designed to allow measurement of the long-term impact of case-finding or care interventions on a wide range of hepatic and extrahepatic events.

## **Healthcare systems**

### *Acceptability by the disciplines involved*

Srivastava *et al* demonstrated that a referral algorithm based on sequential use of FIB-4 and ELF scores in primary care settings achieved a reduction of unnecessary hepatology referrals by 81% and a 5-fold increase in advanced fibrosis case detection. However, the adherence of primary care physicians to patient referral criteria was only 45%. It is therefore important to measure the acceptability of MoCs by

the disciplines involved, identify barriers to implementation, and recognize the need for parsimony to enhance applicability in real-world practice.

#### *Access to multidisciplinary care within the healthcare system*

The involvement of multiple disciplines can incrementally hinder access to care. Some barriers include longer waiting times due to increasing referrals, lack of insurance coverage for some specialties or therapies, reimbursement limitations for lifestyle programs, and limited access to digital technology. Assessing these pertinent metrics in addition to the MoC's efficiency will inform health systems, and payers of the need for healthcare reform.

#### *Healthcare resource utilisation*

The impact of the actions involved in the MoC such as blood tests, elastography, and outpatient visits on healthcare utilisation should be assessed. It is anticipated that the increase in resource utilisation to identify patients at risk will be partially offset by reductions in long-term morbidity, which will result in decreased hospitalizations and healthcare resource use.

#### *Cost-effectiveness*

Successful multidisciplinary MoCs should demonstrate that they do not add to the already high cost of fatty liver disease care (Allen *J Hep* 2023), by assessing cost-effectiveness parameters such as incremental cost-effectiveness ratio, quality adjusted life-years, and disability-adjusted life years.

In summary, we propose a comprehensive list of key elements to be reported in publications evaluating fatty liver disease MoCs to allow critical appraisal of their effectiveness, generalisability, adoptability by the broader medical community, and acceptability by patients.

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