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COST-EFFECTIVENESS OF A CLINICAL CARE PATHWAY FOR THE SCREENING OF METABOLIC DYSFUNCTION-ASSOCIATED STEATOTIC LIVER DISEASE IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

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KEY FINDINGS

1 The American Gastroenterological Association's (AGA's) **Clinical Care Pathway** could be highly cost-effective for the screening of metabolic dysfunction-associated steatotic liver disease (MASLD) in patients with **type 2 diabetes mellitus** (T2DM).

2 In a **simulation study**, the incremental cost-effectiveness ratio (ICER) of the Pathway was USD 50,777 per additional quality-adjusted life year (QALY), relative to usual care.

3 Widespread adoption of the Pathway in clinical practice could critically improve MASLD-related outcomes.

BACKGROUND

- MASLD is the most common cause of chronic liver disease [1].
- The AGA recently published a Clinical Care Pathway to recommend a "best practice" for **non-invasive screening** [2], but it has thus far not been evaluated for cost-effectiveness.
- Routine screening of the general population is impractical, but screening high-risk populations, such as patients with T2DM, could be cost-effective.

OBJECTIVE

To evaluate **cost-effectiveness** of the AGA's Clinical Care Pathway for the screening of MASLD in patients with T2DM.

METHODS

- We developed a **microsimulation model** to evaluate the performance of the Pathway on health-related and economic outcomes.
- We leveraged data from a cohort study which recorded non-invasive test (NIT) scores, specifically, **FIB-4** and **FibroScan® LSM**, for 501 T2DM patients at the University of California at San Diego [3].

< Natural history >
We extended the *NAFLD Simulator* [4], a general population MASLD natural history model, to the T2DM population by calibrating an increased rate of fibrosis progression.

< Base case population >
The base case population consisted of 1 million 50-year-old T2DM patients. For each patient, we sampled a NIT pair, then mapped the NIT pair to a fibrosis stage.

< Time-evolution of NIT scores >
NIT scores were updated every 3 years conditional on patients' change in fibrosis stage over the same period: improved by ≥1 stage, no change, or worsened by ≥1 stage.

< Screening >
We simulated the screening pathway in Figure 1 as a supplement to usual care, in which significant fibrosis may be detected by chance at a rate of 1% per year.

< Treatment >
After diagnosis of significant fibrosis, the base case allocation of patients to drugs was 50% pioglitazone, 25% semaglutide, and 25% combined for a "best of both worlds" effect.

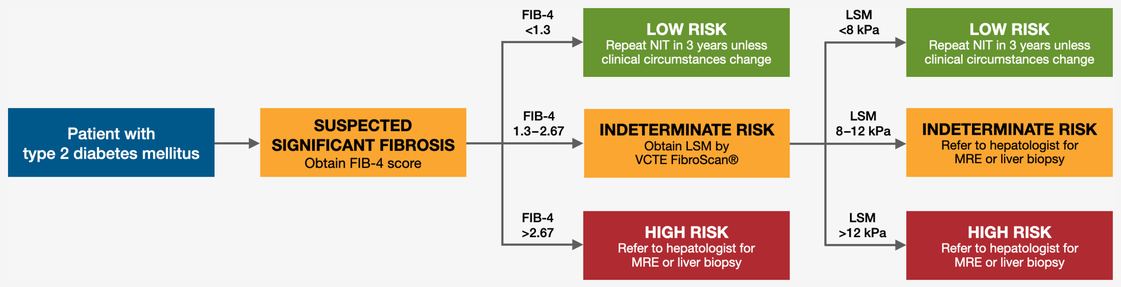

Figure 1. Screening pathway based on the MASLD Clinical Care Pathway

RESULTS

Table 1 summarizes the cost-effectiveness analysis. Using a willingness-to-pay (WTP) threshold of USD 100,000 per additional QALY, the Pathway is cost-effective with an ICER of USD 50,777.

Table 1. Summary of cost-effectiveness analysis

	Usual care	Clinical Care Pathway
Cumulative incidence (per 100,000)		
Decompensated cirrhosis	12,026	9,978
Hepatocellular carcinoma	5,562	4,619
Liver-related deaths	20,168	16,765
Non-liver-related deaths	42,302	41,356
Cost ($ per patient)		
MASLD screening	40	2,345
MASLD intervention	2,917	18,289
MASLD management	37,664	34,362
Cost-effectiveness analysis		
Total cost ($ per patient)	40,620	54,995
QALYs (per patient)	11.95	12.23
ICER ($/additional QALY)	-	50,777

The Pathway remained cost-effective throughout all sensitivity analyses, as shown in Figures 2 and 3, and scenario analyses.

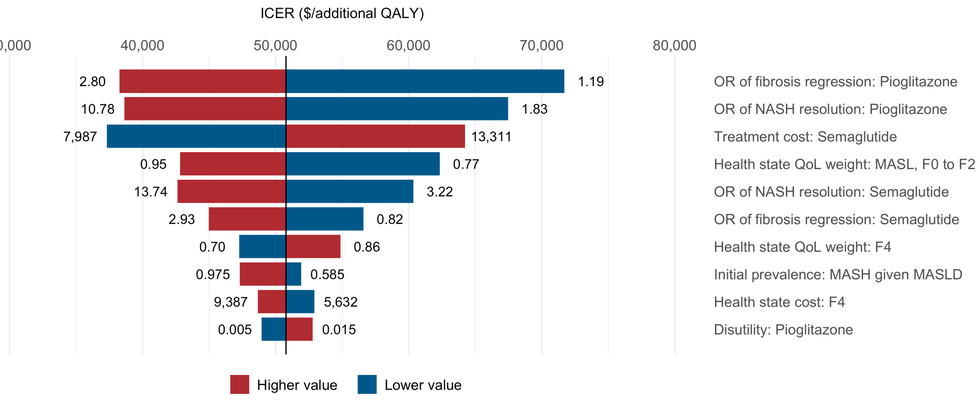

Figure 2. Tornado plot of the 10 most influential parameters

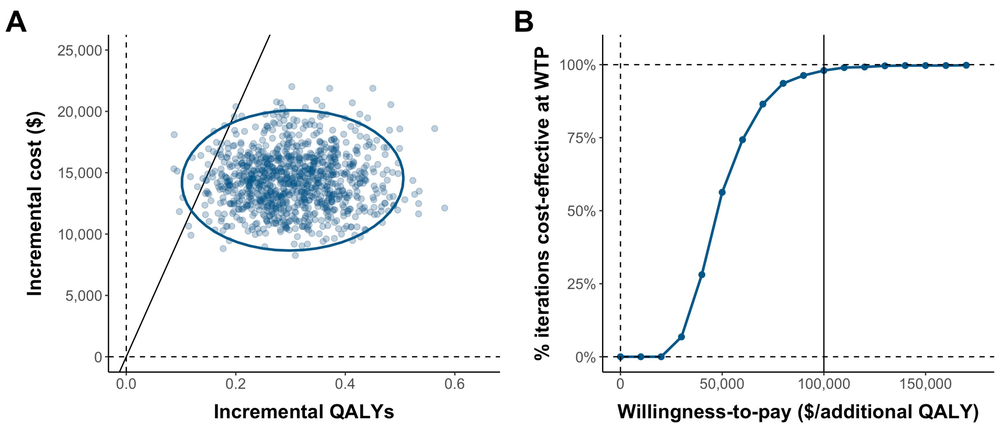

Figure 3. (A) Scatterplot of incremental cost versus incremental QALYs for 1,000 simulation runs; (B) Acceptability curve

REFERENCES
[1] Younossi ZM, Golabi P, Paik JM, et al. The global epidemiology of nonalcoholic fatty liver disease (NAFLD) and nonalcoholic steatohepatitis (NASH): a systematic review. Hepatology (Baltimore, Md.) 2023
[2] Kanwal F, Shubrook JH, Adams LA, et al. Clinical Care Pathway for the Risk Stratification and Management of Patients With Nonalcoholic Fatty Liver Disease. Gastroenterology 2021;161:1657-1669
[3] Ajmera V, Cepin S, Tesfai K, et al. A prospective study on the prevalence of NAFLD, advanced fibrosis, cirrhosis and hepatocellular carcinoma in people with type 2 diabetes. Journal of Hepatology 2022:S0168-8278(22)03302-5
[4] Chhatwal J, Dalgic OO, Chen W, et al. Analysis of a Simulation Model to Estimate Long-term Outcomes in Patients with Nonalcoholic Fatty Liver Disease. JAMA Network Open 2022;5:e2230426