

Supplementary Appendix

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Table S1. Model inputs and assumptions for selected variables

Variable	Baseline Value	Sensitivity Analysis Range	Distribution	Reference
Probability				
Semiannual incidence of HCC in non-obese diabetic patients with MASL	0.00048	0.00005-0.001	Beta	10,21,22,30
Semiannual incidence of HCC in non-obese diabetic patients with MASH	0.0058	0.0005-0.01	Beta	10,21,22
Semiannual incidence of HCC in non-obese diabetic patients with MASH cirrhosis	0.05	0.005-0.1	Beta	21,22,31
Relative excess risk of developing HCC with type 2 diabetes mellitus	2.18	1.78-2.69	Gamma	21,22
Semiannual incidence of HCC in obese diabetic patients with MASL	0.00072	0.0001-0.002	Beta	10,23,30
Semiannual incidence of HCC in obese diabetic patients with MASH	0.0087	0.001-0.02	Beta	10,23
Semiannual incidence of HCC in obese diabetic patients with MASH cirrhosis	0.076	0.01-0.2	Beta	23,31
Relative excess risk of developing HCC with type 2 diabetes mellitus and obesity	3.28	2.27-4.74	Gamma	23
Stage-specific probability of HCC detection without screening, %				
Early-stage HCC	8	5-20	Dirichlet	29
Intermediate-stage HCC	61		Dirichlet	29
Advanced-stage HCC	31			29
Stage-specific probability of HCC detection by MRI or CT, %				
Early-stage HCC	97.7	90-99	Dirichlet	32
Intermediate-stage HCC	2.0		Dirichlet	32
Advanced-stage HCC	0.3		Dirichlet	32
Stage-specific probability of HCC detection by US, %				
Early stage	61.8	57-67	Dirichlet	32

Intermediate stage	33.2		Dirichlet	32
Advanced stage	5.0		Dirichlet	32
Stage-specific 5-year HCC survival rate, %				
Early stage	69.6	60-80	Beta	14
Intermediate stage	37.2	30-50	Beta	14
Advanced stage	8.0	2-20	Beta	14
Semiannual recurrence rate of HCC	0.149	0.05-0.5	Beta	14
Increased risk of all-cause mortality with MASL	1.43		Gamma	33
Increased risk of all-cause mortality with MASH	1.56		Gamma	33
Increased risk of all-cause mortality with MASH cirrhosis	4.4		Gamma	33
Adherence rate of HCC screening, %	32	10-90	Beta	28, Assumption
Liver bleeding complication by percutaneous liver biopsy, %	0.6	0.1-2	Beta	34
Accuracy, %				
US				
Sensitivity	84	76-92	Beta	35
Sensitivity (BMI ≥30)	21	11-30	Beta	15
Specificity	92	85-96	Beta	35
US with AFP				
Sensitivity	97	91-99	Beta	35
Specificity	84	77-89	Beta	35
US with AFP and AFP-L3				
Sensitivity	94	84-99	Beta	36
Specificity	83	77-89	Beta	36

CT				
Sensitivity	74	70-77	Beta	37
Specificity	93	91-94	Beta	37
ECCM-MRI				
Sensitivity	79	72-91	Beta	35
Specificity	89	86-92	Beta	35
EOB-MRI				
Sensitivity	91	88-93	Beta	37
Specificity	96	94-97	Beta	37
Cost, US\$				
AFP	10.1	9.1-11.1	Gamma	38
AFP-L3	33.3	25.0-41.6	Gamma	38
US	52.8	47.5-58.1	Gamma	38
CT	194.2	174.8-213.6	Gamma	38
ECCM-MRI	283.8	255.4-312.2	Gamma	38
EOB-MRI	378.2	340.4-416.0	Gamma	38
Percutaneous liver biopsy	159.3	119.5-199.1	Gamma	38
Treatment of liver bleeding complication	3,788	2,841-4,735	Gamma	38
Treatment of early-stage HCC	9,272	8,345-10,199	Gamma	38,40
Treatment of intermediate-stage HCC	34,836	31,353-38,320	Gamma	38,40
Treatment of advanced-stage HCC	41,086	36,978-45,195	Gamma	38,40
Treatment of HCC recurrence	8,061	7,255-8,867	Gamma	38,40
Health state utility				

Precancer state with MASL	0.88	0.8-0.94	Beta	43,44
Precancer state with MASH	0.80	0.7-0.9	Beta	45
Precancer state with MASH cirrhosis	0.76	0.7-0.9	Beta	45
Liver bleeding complication	0.4	0.2-0.6	Beta	Assumption
Early-stage HCC	0.76	0.7-0.9	Beta	43,44
Intermediate-stage HCC	0.68	0.6-0.8	Beta	43,44
Advanced-stage HCC	0.4	0.2-0.6	Beta	43,44
Recurrent early-stage HCC	0.76	0.7-0.9	Beta	43,44
Recurrent intermediate-stage HCC	0.68	0.6-0.8	Beta	43,44
Recurrent advanced-stage HCC	0.4	0.2-0.6	Beta	43,44
Post-treatment HCC	0.75	0.6-0.9	Beta	43,44
Dead	0	N/A	N/A	

AFP, alpha-fetoprotein; AFP-L3, lectin-reactive alpha-fetoprotein; ECCM-MRI, extracellular contrast-media-enhanced MRI; EOB-MRI, gadoxetic acid-enhanced MRI; HCC, hepatocellular carcinoma; MASH, metabolic dysfunction-associated steatohepatitis; MASL, metabolic dysfunction-associated steatotic liver; MASLD, metabolic dysfunction-associated steatotic liver disease; N/A, not applicable; US, abdominal ultrasound;

Table S2. Results of base-case analyses in diabetic patients with MASLD					
Strategy	Cost (US\$)	Incremental cost (US\$)	Effectiveness (QALYs)	Incremental effectiveness (QALYs)	ICER (US\$/QALY gained)
Non-obese diabetic patients with MASL					
No screening	117.3	-	7.68858	-	-
US	1413.1	1295.7	7.68987	0.00129	1,005,231
CT	2108.0	694.9	7.68995	0.00008	8,777,012
ECCM-MRI	2664.4	556.4	7.69018	0.00023	2,398,818
US with AFP and AFP-L3	1765.1	1647.8	7.69033	0.00174	944,510
US with AFP	1615.0	1497.7	7.69034	0.00176	851,590
EOB-MRI	2333.1	718.1	7.69049	0.00016	4,630,984
Non-obese diabetic patients with MASH					
No screening	1335.1	-	6.89748	-	-
US	2342.0	1006.9	6.91096	0.01348	74,705
CT	2982.8	640.8	6.91202	0.00106	604,124
ECCM-MRI	3484.3	501.6	6.91409	0.00208	241,539
US with AFP and AFP-L3	2630.1	1295.0	6.91490	0.01742	74,345
US with AFP	2484.2	1149.1	6.91520	0.01772	64,860
EOB-MRI	3093.4	609.2	6.91870	0.00351	173,713
Non-obese diabetic patients with MASH cirrhosis					
No screening	7774.3	-	6.16175	-	-
US	7296.2	saving	6.23660	0.07485	Dominant

CT	7624.9	328.6	6.24385	0.00725	45,325
ECCM-MRI	7845.4	220.6	6.25355	0.00970	22,735
US with AFP and AFP-L3	7288.7	saving	6.25411	0.00056	Dominant
US with AFP	7163.5	saving	6.25667	0.00255	Dominant
EOB-MRI	7085.6	saving	6.28721	0.03055	Dominant
Obese diabetic patients with MASL					
No screening	176.1	-	7.68194	-	-
US	720.7	544.6	7.68238	0.00044	1,249,536
CT	2150.1	1429.5	7.68400	0.00162	884,002
ECCM-MRI	2703.9	553.8	7.68435	0.00035	1,592,318
EOB-MRI	2369.8	2193.7	7.68482	0.00287	763,732
Obese diabetic patients with MASH					
No screening	1950.2	-	6.84894	-	-
US	2342.5	392.3	6.85191	0.00297	132,029
CT	3425.1	1082.6	6.87016	0.01825	59,314
ECCM-MRI	3899.1	474.0	6.87317	0.00301	157,650
EOB-MRI	3477.0	1526.8	6.88000	0.03106	49,160
Obese diabetic patients with MASH cirrhosis					
No screening	9665.4	-	6.03027	-	-
US	9479.6	saving	6.03505	0.00479	Dominant
CT	8992.2	saving	6.13267	0.09762	Dominant
ECCM-MRI	9132.9	140.7	6.14429	0.01161	12,112
EOB-MRI	8241.1	saving	6.18841	0.04413	Dominant

AFP, alpha-fetoprotein; AFP-L3, lectin-reactive alpha-fetoprotein; Dominant, less costly and more effective than others; ECCM-MRI, extracellular contrast-MRI; EOB-MRI, gadoteric acid-enhanced MRI; ICER, incremental cost-effectiveness ratio; MASH, metabolic dysfunction-associated steatohepatitis; MASL, metabolic dysfunction-associated steatotic liver; MASLD, metabolic dysfunction-associated steatotic liver disease; QALY, quality-adjusted life-year; US, abdominal ultrasound;