Primary Care Management Pathway
Metabolic Dysfunction- Associated Steatotic Liver Disease

Background

Primary care management pathways are being developed by specialist and primary care groups to support the management of common, non-urgent conditions for which long wait times to specialty care currently exist. The pathways will help identify patients with high-risk features and facilitate early referral to specialists as needed.

Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD, previously known as NAFLD) is the most common liver disease in Canada, occurring in up to 25% of the population. It is often associated with obesity, diabetes and/or hyperlipidemia, and results from accumulation of fat (triglycerides) within the liver cells, which can lead to liver damage. MASLD is an increasingly common indication for liver transplantation and cause of liver cancer in North America. Therefore, the goal is to identify people with MASLD who have developed significant liver fibrosis in order to initiate cancer screening and management of clinically significant portal hypertension.

Defining condition and/or other important definitions

MASLD refers to a group of liver conditions that exist under the same umbrella: simple fatty liver (steatosis), metabolic dysfunction-associated steatohepatitis (MASH), fatty liver with liver fibrosis (liver scarring), and fatty liver with advanced liver fibrosis/cirrhosis.

The clinical care pathway facilitates identification of people with MASLD who are more likely to have advanced scarring and therefore potentially benefit from specialist referral. The pathway employs starting with bloodwork-based tests to assess a patient for high risk or low risk of significant liver scarring based on calculating the **FIB-4 score**.

FIB-4 Score = Age in Years x AST level (U/L) / Platelet Count (10^9/L) x √ALT level (U/L)
(*This formula is readily accessible as an online calculator:
www.mdcalc.com/fibrosis-4-fib-4-index-liver-fibrosis)

The FIB-4 score has a diagnostic accuracy of 0.84 (AUROC) for the identification of advanced fibrosis (Xiao, 2017).

FIB-4 rules out advanced fibrosis in:

- Patients ≤ age 65 with a FIB-4 score of <1.3
- Patients > age 65 with a FIB-4 score of <2.0

FIB-4 score of >3.25 is suggestive of advanced fibrosis. These individuals should be referred to GI or hepatology and should have ultrasounds every 6 months for HCC (hepatocellular carcinoma) screening while pending assessment.

A FIB-4 score between 1.3-3.25 (or between 2.0-3.25 in patients > age 65) is indeterminate. These individuals should have a Fibroscan for further assessment. **This can be arranged directly by the primary care physician through KHSC with requisition on the KSHC pathways website.**

A Fibroscan stiffness of <10 kPa excludes advanced fibrosis and these patients can continue to be followed in the primary care home.

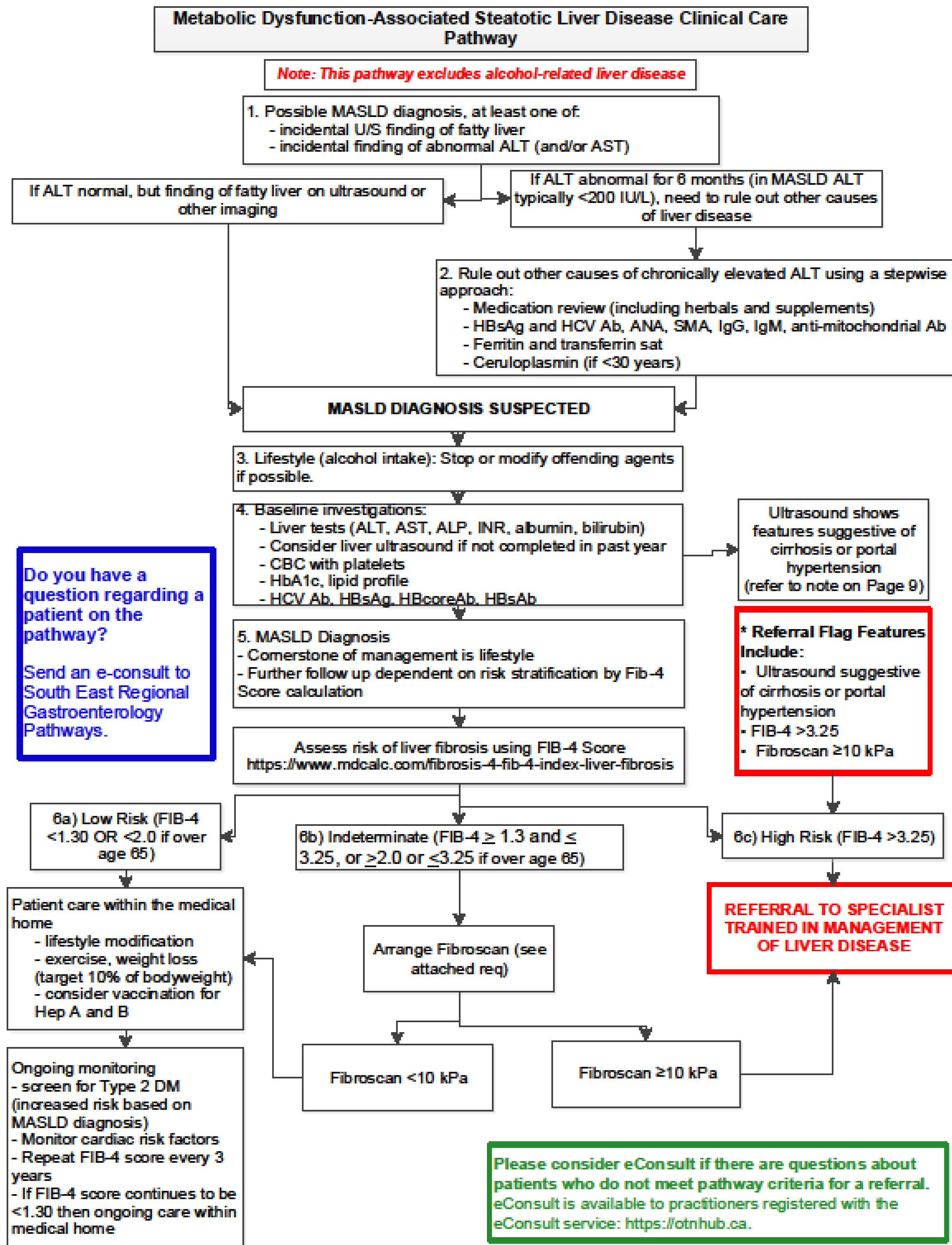
A Fibroscan ≥10 kPa suggests advanced fibrosis. These patients should be referred to GI or hepatology and have ultrasounds every 6 months while pending assessment.

Fibroscans should **NOT be ordered on patients with ascites (confirmed on imaging), patients who are pregnant, or patients with ALT >200. These patients should be referred for specialist assessment**.

Patient information

It is possible that your patient and/or their family member may express a desire for additional information about the primary care management pathway and their role or experience throughout the process of being on a pathway. Additional information for patient education has been provided in “Appendix B – Patient Information”.

Primary Care Management Pathway – Clinical Flow Diagram
Metabolic Dysfunction-Associated Steatotic Liver Disease



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Appendix A – Expanded Detail

Possible MASLD Diagnosis

MASLD diagnosis should be considered for patients with **one or more** of the following:

- Abnormal liver tests (persistent elevation of serum ALT; usually ALT <200)
- Ultrasound finding of fatty liver

Risk factors for MASLD include obesity, type 2 diabetes, hyperlipidemia and metabolic syndrome. Patients with MASLD will not necessarily have elevated liver enzymes and will not necessarily have fatty liver documented on an ultrasound report.

The pathway is not designed for use with patients with significant alcohol consumption (>14 drinks/week for males, >9 drinks/week for females). Counsel patients to reduce their alcohol consumption for 6-8 weeks and then repeat ALT at that time. If ALT remains abnormal then use of this pathway is appropriate.

Rule Out Other Causes of Elevated ALT

For patients with a chronically elevated ALT (>6 mos) **other causes must be ruled out**.

Review and address excess alcohol use (>14 drinks/week for males, >9 drinks/week for females)

Medication Profile Review

- Identify potential causes of abnormal liver tests including herbal preparations and health supplements and medications (this pathway is **not intended for patients on amiodarone, methotrexate, tamoxifen—they should be referred for further fibrosis assessment).**
- Any new or recently prescribed medications, over the counter or herbal/natural product may be implicated.
- If abnormal ALT correlates with new medications or recent dose increase then consider stopping or modifying the offending agent if possible, then repeat liver enzymes in 3-6 months.

Hepatitis B and C Screening (should be completed in all patients)

- HBsAg: If positive, refer to hepatology.
- HCV Ab: If positive, order HCV RNA (PCR). If HCV RNA is positive, then refer to hepatology.

Other Testing (if abnormal ALT >6 months or advanced fibrosis on FIB-4 or Fibroscan)

- ANA, anti-smooth muscle antibody, IgG (for autoimmune hepatitis). The higher the titer, the more significant the test results may be.
  - ANA (>1:80) and/or smooth muscle antibody (>1:20 titer) **and** elevated IgG may suggest autoimmune hepatitis and warrants consideration for referral to GI or hepatology
- Antimitochondral antibody and IgM
  - A positive antimitochondrial antibody may suggest a diagnosis of primary biliary cholangitis (PBC) and warrants a referral to GI or hepatology.
- Ferritin and iron/TIBC
  - Note: Ferritin is often significantly elevated in MASLD but transferrin saturation is typically <50%. These MASLD patients do not have iron overload.
  - If ferritin is elevated and % transferrin saturation is >50% then consider doing genetic testing for hemochromatosis which can be ordered through Life Labs at no cost to the patient. If genetic testing is negative then it is unlikely the patient has genetic hemochromatosis.
- Note: In the routine evaluation of abnormal liver tests **abdominal MRI and/or CT scan or seldom useful and should not be ordered routinely.**

If work-up suggests a non-MASLD diagnosis, consider appropriate referral to specialist trained in managing liver disease.

If work-up for other causes is negative, MASLD diagnosis is strongly suspected based on risk factors, elevated liver enzymes and/or ultrasound findings.

MASLD Baseline Investigations

There are certain laboratory tests outlined in the baseline investigation section of the MASLD pathway that are accompanied with a cost to the patient if the test is requested and administered at a community medical laboratory. To ensure that cost is not a barrier to patient care, Kingston Health Sciences Centre has **developed a unique laboratory requisition to be used only for baseline investigations as outlined on the MASLD pathway**.

The unique laboratory requisition is meant to be completed by referring primary care physicians for patients who are following the MASLD pathway and would prefer to have these tests completed at KHSC (KGH: Armstrong 1 or HDH: Jeanne Mance 5) at no cost to the patient. Patients may still prefer to have these tests completed at a community medical laboratory and pay for the associated costs.

This requisition can be accessed and downloaded by primary care physicians at:
Gastroenterology Referrals | KHSC Kingston Health Sciences Centre**.**

MASLD baseline investigations include:
Liver tests (ALT, AST, ALP, bilirubin, INR, albumin), CBC, platelets, lipid profile, HbA1c, and ultrasound (if not done in past year).

All patients should have HCV Ab and HbsAg ordered if not tested previously (even if liver enzymes are normal).

A diagnosis of MASLD can be assumed if no other causes of fatty liver/elevated liver enzymes have been identified, even in the presence of a normal ultrasound.

Assess risk for liver fibrosis using the FIB-4 score

- A FIB-4 calculator is available at www.mdcalc.com/fibrosis-4-fib-4-index-liver-fibrosis

MASLD with Low Risk of Fibrosis

(FIB-4 <1.3 if ≤ age 65, <2.0 if > age 65) OR Fibroscan <10kpa

Lifestyle modifications are the cornerstone of optimal management of MASLD.

Exercise	30 minutes of moderate activity 4 times/week (can be in 10-15 min sessions).
Diet	Lower in carbohydrates and sugars (especially fructose) Higher in protein and vegetables Avoid saturated fats, simple carbohydrates and sweetened drinks
Weight loss	Target weight loss of 5-10% from lifetime maximum weight over 6 months
Modify cardiac risk factors where appropriate	MASLD patients are at higher risk of developing cardiac disease (3-5 times more likely to suffer a heart attack or stroke) 1. Statins for hyperlipidemia Patient with increased LDL cholesterol should be strongly considered for statin therapy. ***In general, statins are safe in patients with liver disease.*** However, ALT monitoring can be considered in MASLD patients (3 months after starting therapy) and if the ALT doubles, stopping should be considered and a different lipid lowering agent tried. 2. Screen for type 2 diabetes Patients with MASLD who are not diabetic are at increased risk of developing diabetes in the future. 3. Optimize diabetes control, including using GLP-1 agonists if appropriate. 4. Treat hypertension 5. Encourage smoking cessation
Alcohol intake	Alcohol may be a co-factor for fibrosis progression in patients with MASLD. It is unclear if there is an amount of consumption that is safe. Guidelines suggest discouraging use or at least counselling on reduction. **Abstinence** is recommended for patients with advanced fibrosis or cirrhosis.

Bariatric surgery	• In patients whom lifestyle and medical weight loss interventions are not effective, referral to bariatric surgery could be considered if appropriate

Coffee: There is substantial evidence that coffee consumption (2-3 cups per day) may be beneficial for patients with fatty liver.

Semaglutide: GLP-1 agonist used for management of diabetes and weight loss now has Health Canada approval for treatment of MASH with moderate to advanced fibrosis (F2-3 fibrosis). This is based on interim results of the Essence-3 trial which showed that 2.4 mg/week at 72 weeks resulted in resolution of MASH without worsening fibrosis in 62.9% and reduction in at least one stage of fibrosis without worsening of MASH in 36.8%. The clinical trial is still ongoing and final approval will depend on final results of the study expected by Health Canada in 2029. As per AASLD guidelines, patients that may be candidates for this treatment are those with MASLD and a Fibroscan score of 8-15 kPa.

Consider immunizing MASLD patients for hepatitis A and B to avoid superimposed preventable liver disease.

Ongoing Monitoring

Re-calculate FIB-4 score every 3 years to reassess the risk of significant liver fibrosis. Continue management in the medical home if FIB-4 score remains low risk.

MASLD with High Risk of Fibrosis
(FIB-4 >3.25 OR Fibroscan ≥10 kPa

Consider referral to a specialist trained in the management of liver disease.

Given presence of advanced fibrosis, work up for other etiologies of liver disease should be completed even in those with normal liver enzymes. Recommend HCV Ab, HBsAg, HBcoreAb, HBsAb, IgG, IgM, ANA, smooth muscle Ab, antimitochondrial Ab, alpha-1 antitrypsin, ferritin, transferrin saturation (if not already done).

These patients should have ultrasounds every 6 months for HCC screening while awaiting assessment.

MASLD with Indeterminate Risk of Fibrosis
(FIB-4 ≥1.3 but ≤3.25 (or ≥2.0 but ≤3.25 over age 65)

These patients should have additional fibrosis assessment **with a Fibroscan.** This can be ordered directly by primary care physicians, without referral to a specialist, by completing and submitting the requisition on the KHSC pathways website.

Direct Fibroscan testing is only available to patients that have MASLD and are being assessed and followed by a physician using the clinical care pathway.

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The Fibroscan report you will receive will resemble the image below. The liver stiffness is measured in kPa and is located at the top of the report (enclosed in the box).

FibroScan®

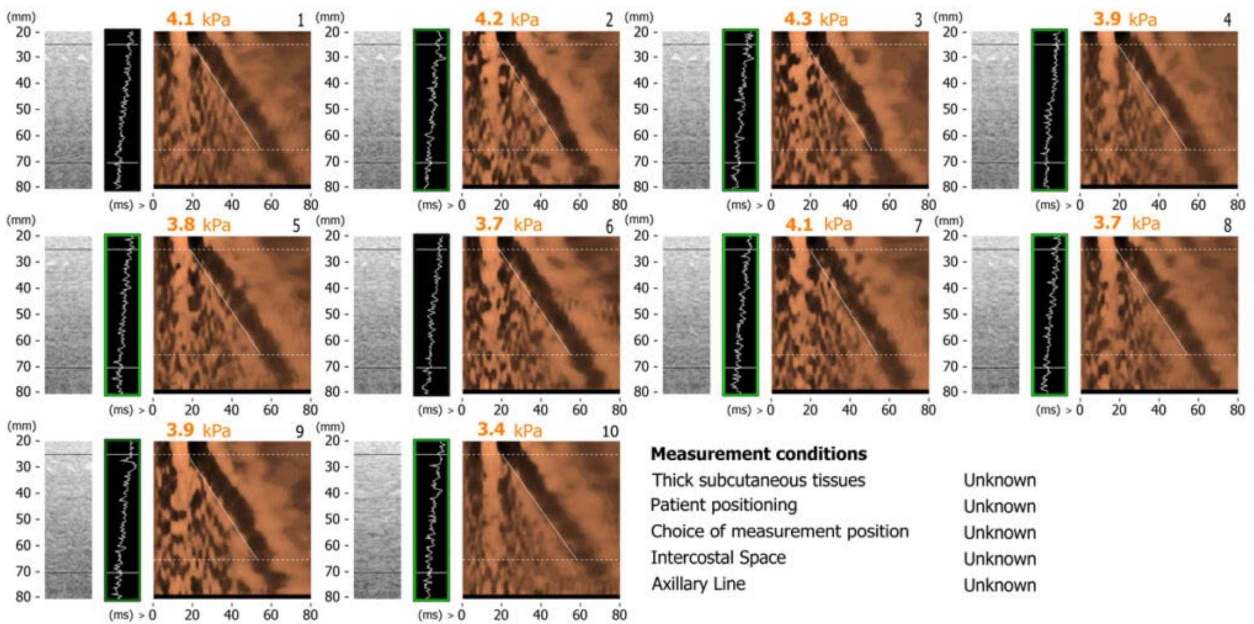
SmartExam: ON

		CAP (dB/m)	E (kPa)		
	SD	MEAN	MEDIAN	IQR/Med	
09/07/1956	8			12%	
		229	3.9		

26/09/2023 16:30:23
Exam: M
SWF = 50Hz
Organ: Liver
Operator:
E-MEASUREMENTS: 12
CAP-LEVEL: >100 %

Height: cm
Weight: kg
Physician:

Fasting: Yes



Measurement conditions

Thick subcutaneous tissues	Unknown
Patient positioning	Unknown
Choice of measurement position	Unknown
Intercostal Space	Unknown
Axillary Line	Unknown

FibroScan 530 Compact / SN: F82072 Probe M+ / SN: 2002447 Software release number FS 4.1.5

FibroScan® is a medical device intended as an aid for the management of patients with liver disease. Measurements should be performed by a certified operator. The values obtained must be interpreted by a physician experienced in dealing with liver disease, taking into account the complete medical records of the patient, the number of valid measurements and their dispersion. Probes must be calibrated according to the manufacturer's recommendations.

Image from: https://theliverclinic.com/your-fibroscan-results-explained/

MASLD with Low Risk of Fibrosis
(FIB-4 indeterminate, but Fibroscan <10kPa)

Refer back to the previous recommendations for patients with low risk fibrosis as measured by FIB-4. These patients should have FIB-4 re-checked in 3 years.

MASLD with High Risk of Fibrosis
(FIB-4 indeterminate, but Fibroscan ≥10kPa)

Consider referral to a specialist trained in the management of liver disease.

Given presence of advanced fibrosis, work up for other etiologies of liver disease should be completed even in those with normal liver enzymes. Recommend HCV Ab, HBsAg, HBcoreAb, HBsAb, IgG, IgM, ANA, smooth muscle Ab, antimitochondrial Ab, alpha-1 antitrypsin, ferritin, transferrin saturation (if not already done).

These patients should have ultrasounds every 6 months for HCC screening while awaiting assessment.

When Should I Refer my Patient to a Specialist?

1. **If FIB-4>3.25 indicating high risk for advanced fibrosis**
2. **Fibroscan ≥10 kPa suggestive of advanced fibrosis**
3. **Ultrasound has features suggesting cirrhosis or portal hypertension (example: collateralization, splenomegaly, ascites).**

If the only concern for cirrhosis on imaging is a “nodular” liver or “coarse echotexture”, which is a nonspecific finding, and FIB-4 is ≤3.25, recommend proceeding with Fibroscan as next step. If <10kPa then cirrhosis is ruled out. If ≥10kPa then refer to specialist

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Appendix B – Patient Information

Please note: This information is intended to be given to the patient, either as a handout or in the form of a conversation with their primary care provider.

What is metabolic dysfunction-associated steatotic liver disease (MASLD)?

- MASLD is a build of fatty tissue in the liver.
- It tends to be associated with obesity, or can also occur in patients with increased fatty tissue around the waistline and those who consume more sugary foods and drinks.
- There is an association between MASLD and diabetes, high cholesterol and high blood pressure.
- It occurs in approximately 25% of Canadians.

How will my doctor follow my condition?

- Majority of patients with MASLD are managed by their primary care provider.
- Your primary care provider will do blood work to monitor your liver enzymes and to monitor for potential damage to the liver.
- They will help counsel you on weight loss and dietary changes. They will also monitor for diabetes, high cholesterol and high blood pressure and manage these conditions as needed.

You are enrolled on the MASLD primary care pathway. What does this mean?

- The pathway helps to provide a map to ensure the care you are receiving is safe and helpful in managing your condition.
- Patients can be enrolled on the pathway for several months, or possibly even for years.
- Your primary care provider will ask you questions about medications or supplements and your alcohol use. They may ask you to do blood work to rule out other conditions affecting the liver.
- They will do blood tests to check if you are at risk of having severe liver damage.
- If you are at higher risk, then you may be referred to a specialist for further assessment.
- If you are low risk, then your primary care team will make a health to help reduce your risk of progression and improve your health.

FibroScan®

A Simple Test for Liver Health

What Is a FibroScan?

A FibroScan is a test that checks how healthy your liver is. It looks for scarring and fat in the liver. The test is painless, quick, and non-invasive. There are no needles, no sedation, and no radiation.

What Happens During the Test?

You will lie on your back on an exam bed and raise your right arm. A small probe is placed on the skin over your liver. The probe sends gentle vibrations into your liver. The test takes about 5 to 10 minutes.

What Will I Feel?

Most people feel light tapping on the skin and no pain. You can relax and breathe normally during the test.

How Do I Prepare for My Appointment?

Do not eat or drink for 3 hours before your test. This includes food, snacks, coffee, tea, juice, and other drinks. You may take small sips of water for medications. Take your usual medications unless your doctor tells you not to. Wear loose, comfortable clothing. A two-piece outfit is best.

After the Test

There is no recovery time. You can eat and drink right away and return to normal activities. Your FibroScan results will be sent to your doctor.

Additional resources

The Canadian Liver Foundation: Fatty Liver Disease. 2026
https://liver.ca/fatty-liver-disease/

Mediterranean-Style of Eating. Alberta Health Services. 2024
https://www.albertahealthservices.ca/assets/info/nutrition/if-nfs-mediterranean-style-of-eating.pdf

Appendix C – Endnotes

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