DOUGLASS HANLY MOIR PATHOLOGY
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New guidance for assessment of lipid status

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Non-fasting specimens are now acceptable

Fasting specimens have traditionally been used for the formal assessment of lipid status (total, LDL and HDL cholesterol and triglycerides). The reasons[1,2] for this approach have been:

- Meals were thought to affect lipoprotein composition, particularly with an increase in triglycerides
- Elevated triglyceride (>4.5 mmol/L) affects the calculation of LDL cholesterol when using the Friedewald equation
- Many studies on which treatment goals are based used fasting specimens for lipid measurement

In 2016, the European Atherosclerosis Society and the European Federation of Clinical Chemistry and Laboratory Medicine released a joint consensus statement that recommends the routine use of non-fasting specimens for the assessment of lipid status.[2] Large population-based studies were reviewed which showed that for most subjects the changes in plasma lipids and lipoproteins values following food intake were not clinically significant. Maximal mean changes at 1–6 hours after habitual meals were found to be:

+0.3 mmol/L	for triglycerides
-0.2 mmol/L	for total cholesterol
-0.2 mmol/L	for LDL cholesterol
-0.2 mmol/L	for calculated non-HDL cholesterol
no change	for HDL cholesterol

Additionally, studies have found similar or sometimes superior cardiovascular disease risk associations for non-fasting compared with fasting lipid test results. There have also been large clinical trials of statin therapy monitoring the efficacy of treatment using non-fasting lipid measurements. Overall, the evidence suggests that non-fasting specimens are highly effective in assessing cardiovascular disease risk and treatment responses.

Key Points

- For most patients, a non-fasting specimen is acceptable for the assessment of lipid status.
- Lipid testing on more than one occasion may be necessary to establish a patient's baseline lipid status and for some patients a fasting specimen may be required.
- Assessment of lipid status may not be valid if testing is performed in the presence of intercurrent illness.
- Non-HDL cholesterol is a clinically useful marker for predicting cardiovascular risk.
- New lipid reference limits and target levels for treatment are under consideration but these have yet to be formally endorsed.

Non-HDL cholesterol as a risk predictor

In the 2016 European joint consensus statement[2] and in previously published guidelines and recommendations, the clinical utility of non-HDL cholesterol (calculated from total cholesterol minus HDL cholesterol) has been noted as a predictor of cardiovascular disease risk. Moreover, this marker has been found to be more predictive of cardiovascular risk when determined in a non-fasting specimen.

What this means for your patients

The assessment of lipid status with a non-fasting specimen has the following benefits:

- No patient preparation is required, thereby reducing non-compliance
- Greater convenience with attendance for specimen collection at any time
- Reports are available for earlier review instead of potential delays associated with obtaining fasting results

Indications for repeat testing or a fasting specimen collection

For some patients, lipid testing on more than one occasion may be necessary in order to establish their baseline lipid status. It is also important to note that an assessment of lipid status carried out in the presence of any intercurrent illness may not be valid.

Conditions for which a fasting specimen collection is recommended[2] include:

- Non-fasting triglyceride >5.0 mmol/L
- Known hypertriglyceridaemia followed in a lipid clinic
- Recovering from hypertriglyceridaemic pancreatitis
- Starting medications that may cause severe hypertriglyceridaemia (e.g., steroid, oestrogen, retinoid acid therapy)
- Additional laboratory tests are requested that require fasting or morning specimens (e.g., fasting glucose, therapeutic drug monitoring)

Lipid reference limits and target levels for treatment are under review

The chemical pathology community in Australia is currently reviewing all relevant publications in order to implement a consensus approach to reporting and interpreting lipid results. This includes the guidelines for management of absolute cardiovascular disease risk developed by the National Vascular Disease Prevention Alliance (NVDPA).[3] The proposed reference limits[2] and target levels[3] shown (Tables 1 and 2), may be used as a guide until such time as these or similar values have been given national endorsement.

TABLE 1

Reference limits for both fasting and non-fasting specimens	
Total cholesterol	<5.0 mmol/L
HDL cholesterol	>1.0 mmol/L
LDL cholesterol	<3.0 mmol/L
Triglycerides	<2.0 mmol/L
Non-HDL cholesterol	<3.9 mmol/L

TABLE 2

Target levels for lipid lowering therapy	
Total cholesterol	<4.0 mmol/L
HDL cholesterol	≥1.0 mmol/L
LDL cholesterol	<2.0 mmol/L
Triglycerides	<2.0 mmol/L
Non-HDL cholesterol	<2.5 mmol/L

Please note that as there is a continuum of risk, a benefit is obtained for any lowering of measured lipids towards the target levels.

Further information

- Absolute cardiovascular disease risk calculator is available at **www.cvdcheck.org.au**
- If familial hypercholesterolaemia is suspected, e.g. LDL cholesterol persistently above 5.0 mmol/L in adults, then advice about diagnosis and management is available at **www.athero.org.au/fh**
- Douglass Hanly Moir Pathology will provide a further update once an Australia-wide consensus concerning lipid assessment has been achieved

References

1. Rifai N, et al. Nonfasting Sample for the Determination of Routine Lipid Profile: Is It an Idea Whose Time Has Come? Clin Chem 2016; 62: 428-35.
2. Nordestgaard BG, et al. Fasting Is Not Routinely Required for Determination of a Lipid Profile: Clinical and Laboratory Implications Including Flagging at Desirable Concentration Cutpoints-A Joint Consensus Statement from the European Atherosclerosis Society and European Federation of Clinical Chemistry and Laboratory Medicine. Clin Chem 2016; 62: 930-46.
3. National Vascular Disease Prevention Alliance, Absolute cardiovascular disease management, Quick reference guide for health professionals, 2012. ©2012 National Stroke Foundation

If you have any further queries, please do not hesitate to contact one of our Chemical Pathologists on (02) 9855 5312.

Dr Joyce Wu
MBBS, MAACB, FRCPA

Dr Nick Taylor
BSc (Med), MBBS, MAACB, FRCPA

Dr Grahame Caldwell
BSc (Med), MBBS, FRCPA

DOUGLASS HANLY MOIR PATHOLOGY | ABN 80 003 332 858
A subsidiary of SONIC HEALTHCARE

14 GIFFNOCK AVENUE, MACQUARIE PARK, NSW 2113, AUSTRALIA
P (02) 9855 5222 | **F** (02) 9878 5077
MAIL ADDRESS, LOCKED BAG 145, NORTH RYDE, NSW 1670, AUSTRALIA

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