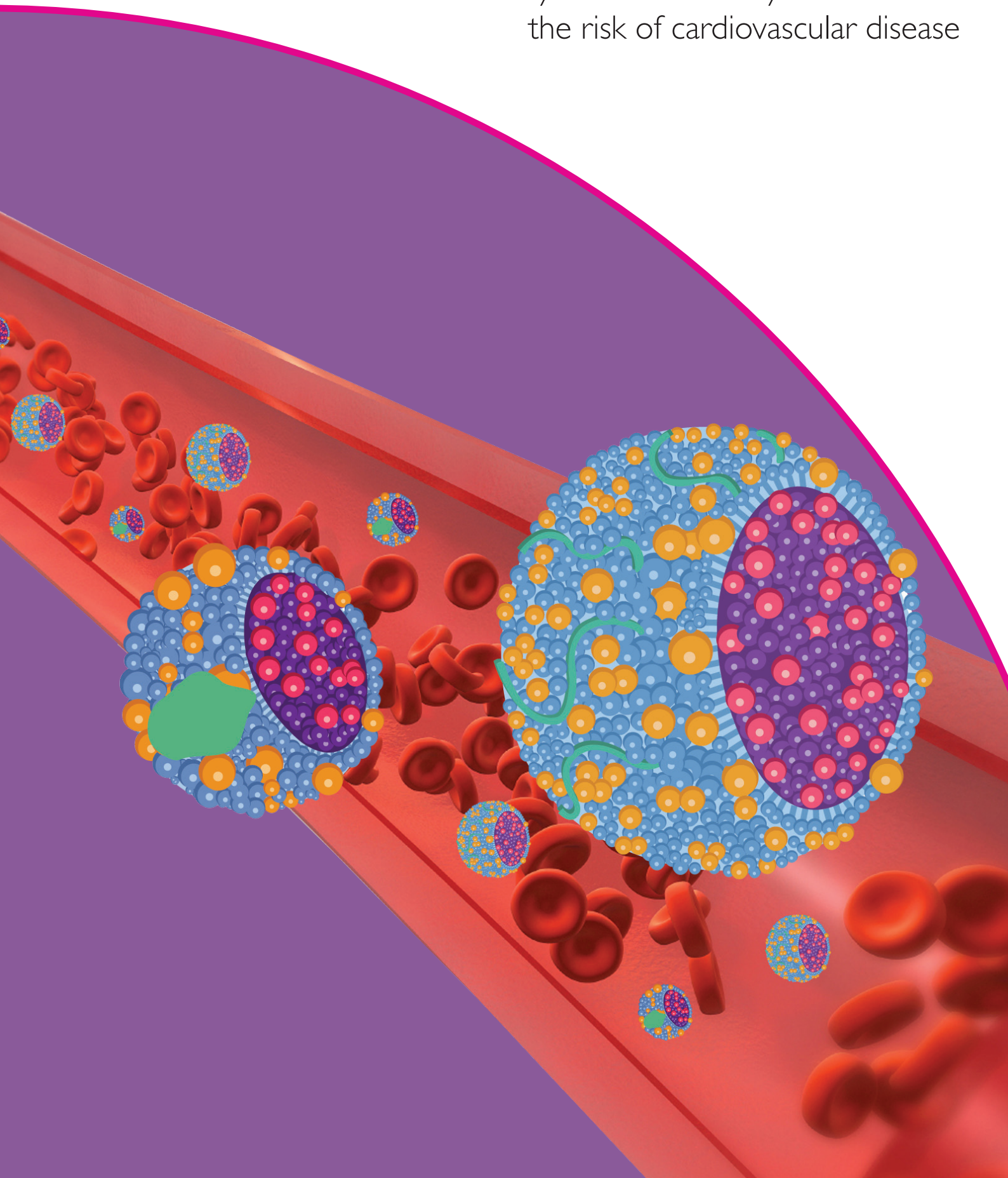
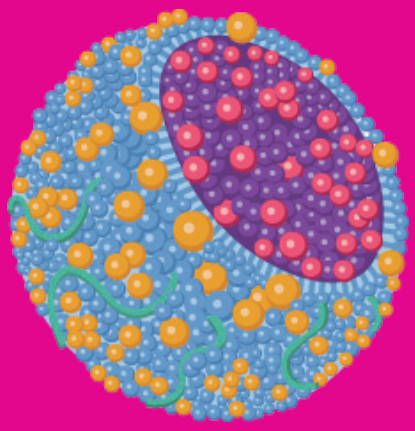
RANDOX

Cardiac risk assessment

Automated assays for clinical analysers to assess the risk of cardiovascular disease





CARDIAC RISK ASSESSMENT

With the Randox Lipid Profile and hsCRP Test

Cardiac risk assessment refers to a group of blood tests and other health factors used to determine an individual's risk of having a heart attack or stroke.

Lipid Profile, *an overview*

The lipid profile is perhaps the most important of the cardiac risk tests providing a good indication of whether someone is likely to have a coronary event caused by a blockage of the blood vessels or atherosclerosis. The Randox lipid profile includes the following tests:

• Total Cholesterol • Triglycerides • HDL Cholesterol • LDL Cholesterol

Health factors leading to cardiovascular disease (CVD)

• Gender • Age • Family History • Ethnicity • Smoking • Physical Inactivity
• Obesity • Diabetes • Hypertension • Diet

In addition to conventional risk factors such as the lipid profile there are several other emerging biomarkers associated with an increased risk of cardiovascular disease.

Extended lipid Profile	Apolipoprotein A-I Apolipoprotein B
Emerging risk factors	High sensitivity CRP Lipoprotein (a) sLDL Apolipoprotein A-II Apolipoprotein C-II Apolipoprotein C-III Apolipoprotein E

Randox is a leading provider of diagnostic reagents for the assessment of cardiovascular disease risk. Our extensive menu of cardiac biomarkers offers superior performance and is available for use on a wide range of chemistry analysers.

LIPID PROFILE

Total Cholesterol

Total Cholesterol measures all lipoprotein sub-classes to assess a patient's overall cholesterol level. High levels of cholesterol in the blood are associated with atherosclerosis and an increased risk of heart disease. As such cholesterol testing plays a vital role in preventative health care. Both the American National Cholesterol Education Programme (NCEP) and the European Society of Cardiologists (ESC) recommend levels below 5mmol/l.

The Randox Total Cholesterol assay is based on the CHOD-PAP colorimetric method. All reagents are liquid ready-to-use and suitable for use on a wide range of chemistry analysers.

Triglycerides

High triglyceride levels increase the atherogenicity of HDL and LDL cholesterol. Triglyceride levels are elevated immediately after a meal with high levels dramatically affecting the accuracy of HDL and LDL measurements. A triglyceride concentration below 1.7 mmol/L is desirable. Levels higher than this are not only associated with an increased risk of heart disease but also Type 2 diabetes, kidney disease, hypothyroidism and pancreatitis.

The Randox Triglycerides assay is based on the GPO-PAP colorimetric method and is available in both liquid and lyophilised formats with fully automated applications available for a wide range of chemistry analysers.

TOTAL CHOLESTEROL (CH 3810)

Wide measuring range
0.865 -16.6 mmol/l

Within run precision
3.73% at 1.71 mmol/l
3.84% at 7.70 mmol/l

Between run precision
1.33% at 1.67 mmol/l
1.39% at 7.52 mmol/l

Onboard stability
28 days at 10°C

No interferences were seen up to the following concentrations:

Haemoglobin	1000 mg/dl
Free bilirubin	25 mg/dl
Conjugated bilirubin	25 mg/dl
Triglycerides	600 mg/dl
Intralipid®	800 mg/dl

A correlation coefficient of r = 0.99 was obtained with a competitor method

TRIGLYCERIDES (TR 3823)

Wide measuring range
0.134 - 12.7 mmol/l

Within run precision
3.29% at 0.308 mmol/l
1.77% at 5.61 mmol/l

Between run precision
3.51% at 0.642 mmol/l
1.33% at 3.03 mmol/l

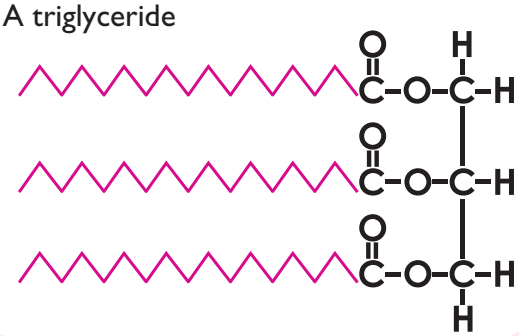
Working reagent stableness
21 days at + 2 - 8°C

No interferences were seen up to the following concentrations:

Haemoglobin	1000 mg/dl
Free bilirubin	18.75 mg/dl
Conjugate bilirubin	25 mg/dl

A correlation coefficient of r = 0.99 was obtained with a competitor method

A triglyceride



LIPID PROFILE

HDL Cholesterol

High-density lipoproteins (HDL-C) are one of the major classes of plasma lipoproteins. HDL-C is often referred to as 'good cholesterol' since it transports cholesterol from the tissues to the liver for removal from the body. High levels of HDL-C can lower an individual's risk of developing heart disease. If HDL-C accounts for 20% of an individual's total cholesterol then the risk of developing heart disease is less than average. The NCEP recommends the following:

Low	<1.01mmol/l
Borderline	1.01 – 1.54mmol/l
Desirable	1.54mmol/l

The Randox HDL kit utilises a direct clearance method for superior performance. Furthermore all reagents are liquid ready-to-use with applications available for a wide range of chemistry analysers.

Benefits of the Randox Direct Clearance Method

Several methods have been developed for the direct measurement of HDL-C, although many of these direct methods perform well with normal samples. They show reduced specificity and often underestimate the concentration of HDL-C in samples containing abnormal lipoproteins e.g. those from patients with elevated triglycerides or liver damage.

The Randox direct clearance method offers superior performance to these methods and works by completely removing all non-HDL components resulting in a high degree of accuracy and specificity even with abnormal samples.

Reaction Principle:

Step 1. Elimination of chylomicrons, VLDL-C and LDL-C by cholesterol esterase, cholesterol oxidase and subsequently catalase.

$$\text{Cholesterol ester} + \text{Cholesterol} + O_2 \xrightarrow[\text{Cholesterol Oxidase}]{\text{Cholesterol Esterase}} \text{Cholesterol + fatty acid} + \text{Cholestenone} + H_2O_2$$

$$2H_2O_2 \xrightarrow{\text{Catalase}} 2H_2O + O_2$$

Step 2. Specific measurement of HDL-Cholesterol after release of HDL-Cholesterol by detergents in Reagent 2.

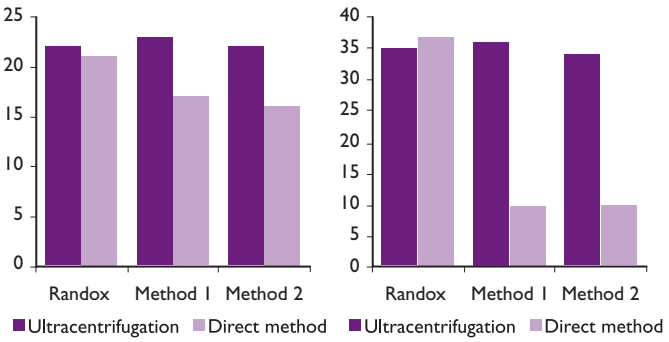
$$\text{Cholesterol ester} + \text{Cholesterol} + O_2 \xrightarrow[\text{Cholesterol Oxidase}]{\text{Cholesterol Esterase}} \text{Cholesterol + fatty acid} + \text{Cholestenone} + H_2O_2$$

$$2H_2O_2 + \text{4 - Aminoantipyrine + HDAOS} \xrightarrow{\text{Peroxidase}} \text{Quinone pigment} + 4H_2O$$

In the second reaction catalase is inhibited by sodium azide in Enzyme Reagent 2. HDAOS = N - (2 - hydroxy - 3 - sulfopropyl) - 3,5 - dimethoxyaniline

Performance in discrepant patient samples

The following graphs compare the performance of the Randox direct clearance method and two other direct masking methods with the ultracentrifugation reference method in two abnormal samples. The Randox direct clearance method compares well with the ultracentrifugation method, however the two other commercially available direct masking methods seriously underestimate the concentration of HDL.



HDL-C (CH3811)

Wide measuring range	0.189 - 3.73 mmol (7.30 - 144 mg/dl)
Intra-assay precision	1.80% at 0.788 mmol/l 3.11% at 2.00 mmol/l
Inter-assay precision	2.81% at 0.817 mmol/l 2.73% at 2.01 mmol/l
Onboard stability	28 days at 10°C

No interferences were seen up to the following concentrations:

Haemoglobin	1000 mg/dl
Free bilirubin	25 mg/dl
Conjugate bilirubin	25 mg/dl
Intralipid	800 mg/dl
Triglycerides	1000 mg/dl

A correlation coefficient of r = 0.99 was obtained when compared to the ultracentrifugation reference method

LIPID PROFILE

LDL Cholesterol

LDL-C, often referred to as 'bad cholesterol' transports cholesterol to the tissues and is linked to the development of atherosclerotic lesions. Accurate measurement of LDL-C is therefore of vital importance in therapies which focus on lipid reduction to prevent or reduce the progress of atherosclerosis and to avoid plaque rupture. The NCEP recommends the following:

Optimal	<2.56mmol/l
Near Optimal	2.56 – 3.3mmol/l
Borderline High	3.3 – 4.0mmol/l
High	4.1 – 4.85mmol/l
Very High	>4.85mmol/l

The Randox LDL-C kit utilises a direct clearance method for superior performance. Furthermore all reagents are liquid ready to use with applications available for a wide range of chemistry analysers.

Direct LDL vs. Friedewald Equation

Many laboratories choose to calculate LDL-C using the Friedewald equation. The Friedewald equation was initially used before commercial LDL-C assays were available. It enables the estimation of LDL when triglyceride and HDL levels are known however is only accurate if triglyceride levels are <400mg/dl, chylomicrons are not present and the sample does not contain beta-VLDL.

Reaction Principle:

Step 1. Elimination of chylomicrons, VLDL-Cholesterol and HDL-Cholesterol by cholesterol esterase, cholesterol oxidase and subsequently catalase.

$$\text{Cholesterol ester} \xrightarrow[\text{Cholesterol Oxidase}]{\text{Cholesterol Esterase}} \text{Cholesterol} + \text{fatty acid}$$
$$\text{Cholesterol} + O_2 \xrightarrow{\text{Cholesterol Oxidase}} \text{Cholestenone} + H_2O_2$$
$$2H_2O_2 \xrightarrow{\text{Catalase}} 2H_2O + O_2$$

Step 2. Specific measurement of HDL-Cholesterol after release of LDL-Cholesterol by detergents in Reagent 2.

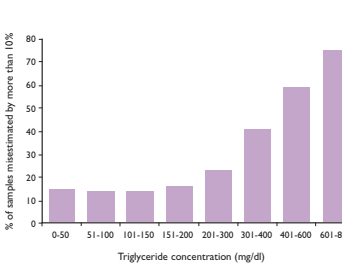
$$\text{Cholesterol ester} \xrightarrow[\text{Cholesterol Oxidase}]{\text{Cholesterol Esterase}} \text{Cholesterol} + \text{fatty acid}$$
$$\text{Cholesterol} + O_2 \xrightarrow{\text{Cholesterol Oxidase}} \text{Cholestenone} + H_2O_2$$
$$2H_2O_2 + 4\text{-Aminoantipyrine} + \text{TOOS} \xrightarrow{\text{Peroxidase}} \text{Quinone pigment} + 4H_2O$$

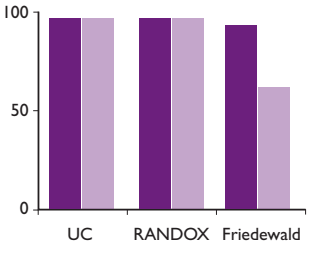
In the second reaction catalase is inhibited by sodium azide in Enzyme Reagent 2. TOOS = N-Ethyl - N - (2 hydroxy - 3 sulfopropyl) - 3 - methylaniline.

Why use a clearance method for LDL cholesterol?

Like the Randox kit most commercially available direct LDL assays are based on the clearance method, however the detergents and buffering systems used vary, leading to differences in assay performance. The Randox direct LDL assay requires no sample pre-treatment and is in excellent correlation to both the ultracentrifugation and precipitation methods. Furthermore our advanced reagent formulation enables rapid clearance of turbidity resulting in minimal interference from patient samples.

Mis-estimation of LDL by calculation method with increasing triglycerides





UC = Ultracentrifugation

LDL-C (CH3841)

Wide measuring range	0.189 - 22.2 mmol (7.3 - 860 mg/dl)
Intra-assay precision	1.47% at 2.74 mmol/l 2.99% at 4.42 mmol/l
Inter-assay precision	2.5% at 2.52 mmol/l 1.58% at 5.34 mmol/l
Onboard stability	28 days at 10°C

No interferences were seen up to the following concentrations:

Triglycerides	600 mg/dl
Bilirubin	25 mg/dl
Haemoglobin	1000 g/dl

A correlation coefficient of r = 0.99 was obtained when compared to the ultracentrifugation reference method

EXTENDED LIPID PROFILE

Why measure Apolipoproteins?

Apolipoproteins and the ratio between them are useful in the assessment of cardiovascular risk. They have particular value in monitoring lipid lowering therapies where HDL-C and LDL-C alone are less predictive of future cardiovascular events.

Apolipoprotein A-I

The main role of Apolipoprotein A-I (Apo A-I) is in the removal of excess cholesterol from extra-hepatic tissues. Like HDL Cholesterol Apo A-I can be described as non-atherogenic showing an inverse relationship to cardiovascular disease risk. Individuals with cardiovascular disease generally have reduced levels of Apo A-I and increased levels of Apo B.

The Randox Apo A-I assay is based on an immunoturbidimetric method. All reagents are liquid ready-to-use and suitable for use on a wide range of chemistry analysers.

Apolipoprotein B

Apolipoprotein B (Apo B) is the main protein in LDL Cholesterol and is the ligand concerned with the uptake of cholesterol. Elevated levels of Apo B indicate an increased risk of cardiovascular disease even when total and LDL cholesterol levels are normal. Apo B is often tested alongside Apo A-I to determine the Apo B/Apo A-I ratio which is sometimes used as an alternative to the total cholesterol/HDL cholesterol ratio when determining cardiovascular risk.

The Randox Apo B assay is based on an immunoturbidimetric method. All reagents are liquid ready-to-use and suitable for use on a wide range of chemistry analysers.

APO A-I (LP3838)

Wide measuring range	6.5 - 233 mg/dl
Within run precision	2.67% at 76 mg/dl 4.1% at 221 mg/dl
Between run precision	3.19% at 70 mg/dl 3.22% at 2.22 mg/dl
Onboard stability	28 days at 10°C

No interferences were seen up to the following concentrations:

Haemoglobin	1000 mg/dl
Free bilirubin	25 mg/dl
Conjugate bilirubin	25 mg/dl
Intralipid	200 mg/dl
Triglycerides	800 mg/dl

A correlation coefficient of r = 0.99 was obtained when compared to the ultracentrifugation reference method

APO B (LP3839)

Wide measuring range	11.2 - 184 mg/dl
Within run precision	3.86% at 52.7 mg/dl 4.1% at 154 mg/dl
Between run precision	1.79% at 49.4 mg/dl 2.57% at 127 mg/dl
Onboard stability	28 days at 10°C

No interferences were seen up to the following concentrations:

Haemoglobin	1000 mg/dl
Free bilirubin	25 mg/dl
Conjugate bilirubin	25 mg/dl
Intralipid	400 mg/dl
Triglycerides	800 mg/dl

A correlation coefficient of r = 0.95 was obtained when compared to the ultracentrifugation reference method

EMERGING RISK FACTORS

High Sensitivity CRP

High Sensitivity CRP (hsCRP) in addition to lipid evaluation and risk scoring systems helps in the assessment of cardiovascular disease (CVD) risk. The American Heart Association (AHA) and Centre for Disease Control and Prevention (CDC) now recommend the use of hsCRP as a more sensitive marker of CVD risk compared to traditional CRP assays. The hsCRP assay is particularly useful in predicting future cardiac events in individuals with no previous history of CVD. Healthy individuals with CRP levels higher than 3mg/l are 2 to 4 times more likely to have a heart attack or stroke.

Approximately half of all heart attacks occur in patients who have a normal lipid profile and are classified as low risk based on traditional methods of risk estimation. The measurement of hsCRP can therefore help clinicians to identify these individuals earlier; it can also be used to evaluate the risk of a recurrent cardiac event. In high risk groups there have even been indications that CRP could be used as a prognostic tool. AHA/CDC risk assessment guidelines:

Low Risk	**<1mg/l**
Average Risk	**1 – 3 mg/l**
High Risk	**>3mg/l**

The Randox hsCRP assay is based on an immunoturbidimetric method. All reagents are liquid ready-to-use and suitable for use on a wide range of chemistry analysers.

Lipoprotein (a)

Lipoprotein (a), (Lp(a)) in combination with other lipid tests can provide clinicians with much needed additional information on an individual's risk of CVD. High levels of Lp(a) are known to occur in individuals with an otherwise normal lipid profile as such it is thought to contribute to an increased risk of CVD independent of other lipids. It is also of particular use in assessing the risk of coronary heart disease in specific populations as Lp(a) concentrations are genetically determined and vary with ethnic population.

Although not a routinely requested test the European Atherosclerosis Society (EAS), the national cholesterol education programme and the national academy of clinical biochemistry recognise the usefulness of Lp(a) and recommend testing patients with a family history of premature CVD or those classified as moderate/high risk. The Randox Lp(a) assay is based on an immunoturbidimetric method. All reagents are liquid ready to use and suitable for use on a wide range of chemistry analysers.

Why use the Randox Lp(a) assay?

Lp(a) is an LDL like particle with a molecule of Apo B-100 linked by a disulphide bridge to Apo(a). Apo (a) is unique in that it is extremely heterogeneous in size due to the Kringle 4 Type 2 domain which can be present in up to 40 copies. This size heterogeneity of Apo(a) affects to varying degrees the outcome of many commercially available Lp(a) kits resulting in over estimation of samples containing large apo(a) molecules and an under estimation of samples containing small apo(a) molecules. Research has documented and shown the Randox method to be one of only few to exhibit minimum size related bias.

hsCRP (CP3885)

Wide measuring range	0.477 - 10.0 mg/dl
Intra-assay precision	2.57% CV at 1.10 mg/l 1.21% CV at 4.91 mg/l
Inter-assay precision	4.44% CV at 1 mg/l 1.22% CV at 4.98 mg/l

No interferences were seen up to the following concentrations:

Haemoglobin	1000 mg/dl
Free bilirubin	25 mg/dl
Conjugate bilirubin	25 mg/dl
Intralipid	800 mg/dl
Triglycerides	1000 mg/dl

A correlation coefficient of r = 0.99 was obtained when compared to the ultracentrifugation reference method

LP(a) (LP3403)

Wide measuring range	3.4 - 90 mg/dl
Within run precision	2.3% CV at 19.9 mg/dl 1.72 CV at 59.14 mg/dl
Between run precision	6.09% at 22.8 mg/dl 2.99 at 57.7 mg/dl
Onboard stability	28 days at 10°C

No interferences were seen up to the following concentrations:

Ascorbic Acid	50 mg/dl
Bilirubin	35 mg/dl
Haemoglobin	1040 mg/dl
Intralipid	5%
Triglycerides	493 mg/dl
Plasminogen	200 mg/dl
Apo B	200 mg/dl

Antigen excess effects are not noted with concentrations <341mg/dl
A correlation coefficient of r = 0.99 was obtained when compared to the ultracentrifugation reference method

EMERGING RISK FACTORS

Small Dense LDL (sLDL)

LDL cholesterol is considered the most atherogenic component of cholesterol constituting a major risk factor for cardiovascular disease (CVD). There are two main types of LDL which differ in terms of size, density and composition; large buoyant LDL and small dense LDL. Small dense LDL Cholesterol (sLDL) penetrates the arterial wall more readily, has a lower binding affinity for the LDL receptor and a longer plasma half life making it more atherogenic than the larger LDL subtype. Research has shown individuals with a predominance of sLDL have a 3-fold increased risk of myocardial infarction.

Determination of sLDL allows the clinician to get a more comprehensive picture of lipid risk factors and tailor treatment accordingly. Measurements are useful in cases of;

- Coronary or peripheral arterial disease
- Hyper/Dyslipidemia
- Hypertension
- Diabetes

To date, ultracentrifugation and electrophoresis-based methods are used for the measurement of sLDL cholesterol, however these methods are both laborious and time-consuming. Randox provides a liquid ready-to-use direct method for the quantitative determination of sLDL cholesterol on a wide range of automated chemistry analysers.

Apolipoprotein A-II

Apolipoprotein A-II (APO A-II) is a major constituent of HDL cholesterol and plays an important role in reverse cholesterol transport and lipid metabolism. The distribution of Apo A-I within the HDL particle is primarily determined by the production rate of Apo A-II. Increased production of Apo A-II promotes atherosclerosis by decreasing the proportion of anti-atherogenic HDL containing Apo A-I.

The Randox Apo A-II assay is based on an immunoturbidimetric method. All reagents are liquid ready-to-use and suitable for use on a wide range of chemistry analysers.

sLDL (562616)

Wide measuring range 4 - 100 mg/dl

Within run precision was assessed in 10 replicated measurements and CVs were always below 3%

No interferences were seen up to the following concentrations:

Ascorbic Acid	50 mg/dl
Bilirubin (Conjugated)	30 mg/dl
Bilirubin (Unconjugated)	30 mg/dl
Haemoglobin	500 mg/dl

A correlation coefficient of r = 0.99 was obtained when compared to the ultracentrifugation reference method

1 Austin MA et al: JAMA 1988: Low density lipoprotein subclass patterns and risk of myocardial infraction.

APO A-II (LP3867)

Wide measuring range	6.75 - 61.1 mg/dl
Intra assay precision	2.64% CV at 15.4 mg/dl
	1.41% CV at 46.3 mg/dl
Between run precision	1.56% CV at 15.8 mg/dl
	2.00% CV at 45.8 mg/dl
Onboard stability	28 days at 10°C

No interferences were seen up to the following concentrations:

Haemoglobin	1000 mg/dl
Free Bilirubin	25 mg/dl
Conjugated Bilirubin	25 mg/dl
Intralipid	1000 mg/dl
Triglycerides	1000 mg/dl

A correlation coefficient of r = 0.98 was obtained when compared to the ultracentrifugation reference method

EMERGING RISK FACTORS

Apolipoprotein C-II

Apolipoprotein C-II (APO C-II) acts as a co-factor for lipoprotein lipase, an enzyme that breaks down lipoproteins and hydrolyses triglycerides in chylomicrons and VLDL for absorption into tissue cells. Apo C-II deficiency has been linked with hypertriglyceridemia.

The Randox Apo C-II assay is based on an immunoturbidimetric method. All reagents are liquid ready-to-use and suitable for use on a wide range of chemistry analysers.

Apolipoprotein C-III

Apolipoprotein C- III (Apo C-III) circulates in the plasma in association with triglyceride rich lipoproteins (chylomicrons, VLDL and IDL) and HDL. Apo C-III modulates the uptake of triglyceride-rich lipoproteins by the LDL receptor related protein through inhibition of lipoprotein lipase. Elevated levels of Apo C-III are associated with both primary and secondary hypertriglyceridemia.

Genetically determined Apo C-III deficiency in humans has shown to increase the rate of triglyceride clearance from the plasma by 6 to 7-fold. Apo C-III levels have been reported higher in many pathological conditions including Type 2 diabetes, hyperbilirubinemia, kidney deficiency and decreased thyroid function.

The Randox Apo C-III assay is based on an immunoturbidimetric method. All reagents are liquid ready-to-use and suitable for use on a wide range of chemistry analysers.

APO C-II (LP3866)

Wide measuring range	1.48 – 9.7 mg/dl
Intra assay precision	4.33% CV at 0.672 mg/dl
	1.40% CV at 5.66 mg/dl
Inter assay precision	4.91% CV at 0.786 mg/dl
	1.07% CV at 5.32 mg/dl
Onboard stability	28 days at 10°C

No interferences were seen up to the following concentrations:

Haemoglobin	1000 mg/dl
Free Bilirubin	25 mg/dl
Conjugated Bilirubin	25 mg/dl
Intralipid	1000 mg/dl
Triglycerides	1000 mg/dl

A correlation coefficient of r = 1.00 was obtained with a competitor method

APO C-III (LP3865)

Wide measuring range	2.16 – 21.7 mg/dl
Intra assay precision	1.40% CV at 3.74 mg/dl
	1.23% CV at 13 mg/dl
Between run precision	1.44% CV at 3.88 mg/dl
	1.23% CV at 13.2 mg/dl
Onboard stability	28 days at 10°C

No interferences were seen up to the following concentrations:

Haemoglobin	1000 mg/dl
Free Bilirubin	25 mg/dl
Conjugated Bilirubin	25 mg/dl
Intralipid	1000 mg/dl
Triglycerides	1000 mg/dl

A correlation coefficient of r = 1.00 was obtained with a competitor method

EMERGING RISK FACTORS

Apolipoprotein E

Apolipoprotein E (APO E) has many functions including the transport of triglycerides to the liver and distribution of cholesterol between cells. Apo E deficiency gives rise to high serum cholesterol and triglyceride levels and as a result leads to premature atherosclerosis. It has also been shown to affect the formation of atherosclerotic lesions by inhibiting platelet aggregation.

The Randox Apo E assay is based on an immunoturbidimetric method. All reagents are liquid ready to use and suitable for use on a wide range of chemistry analysers.

APO E (LP3864)

Wide measuring range	1.04 – 12.3 mg/dl
Intra assay precision	2.79% CV at 0.82 mg/dl
	1.03% CV at 6.22 mg/dl
Inter assay precision	4.66% CV at 0.85 mg/dl
	0.84% CV at 6.14 mg/dl
Onboard stability	28 days at 10°C

No interferences were seen up to the following concentrations:

Haemoglobin	1000 mg/dl
Free Bilirubin	25 mg/dl
Conjugated Bilirubin	25 mg/dl
Intralipid	1000 mg/dl
Triglycerides	1000 mg/dl

A correlation coefficient of r = 1.00 was obtained with a competitor method

Description	Method	Size	Cat. No.
Lipid Profile			
Cholesterol (Liquid)	CHOD-PAP	6 x 30ml	CH200
Cholesterol (Liquid)	CHOD-PAP	6 x 100ml	CH201
Cholesterol (Liquid)	CHOD-PAP	8 x 250ml	CH202
Cholesterol (Dimension)	CHOD-PAP	240 Tests	CH2823
Cholesterol (Liquid, RX series)	CHOD-PAP	8 x 51ml	CH3810
Cholesterol E.P (Liquid)	CHOD-PAP	9 x 50ml	CH7945
Cholesterol (Liquid)	CHOD-PAP	12 x 66ml	CH9715
Cholesterol (Liquid, RX suzuka)	CHOD-PAP	4 x 68ml	CH8019
Triglycerides	GPO-PAP	6 x 15ml	TR210
Triglycerides	GPO-PAP	5 x 100ml	TR212
Triglycerides	GPO-PAP	10 x 50ml	TR213
Triglycerides (Liquid)	GPO-PAP	4 x 100ml	TR1697
Triglycerides (Dimension)	GPO-PAP	240 Tests	TR2820
Triglycerides (Liquid, RX series)	GPO-PAP	6 x 51ml	TR3823
Triglycerides (Liquid)	GPO-PAP	6 x 500ml	TR7663
Triglycerides	GPO-PAP	6 x 50ml	TR7971
Triglycerides	GPO-PAP	12 x 66ml	TR9728
Triglycerides (RX suzuka)	GPO-PAP	RI 4 x 58ml R2 4x 2 ml	TR8067
HDL Cholesterol (Liquid)	Clearance	R1 3 x 2.5L R21 x 2.5L	CH1383
HDL Cholesterol (Liquid)	Clearance	R1 6 x 30ml R2 3 x 20ml	CH2652
HDL Cholesterol (Liquid)	Clearance	R1 6 x 78ml R2 3 x 52ml	CH2655
HDL Cholesterol (Liquid)	Clearance	R1 5 x 252ml	CH2664
HDL Cholesterol (Liquid)	Clearance	R2 3 x 150ml	CH2665
HDL Cholesterol (Dimension)	Clearance	240 Tests	CH2849
HDL Cholesterol (Dimension AHDL)	Clearance	240 Tests	CH2861
HDL Cholesterol (Liquid, RX series)	Clearance	R1 3 x 51ml R2 3 x 20ml	CH3811
HDL Cholesterol (Synchron)	Clearance	540 Tests	CH5730
HDL Cholesterol (Liquid)	Clearance	R1 6 x 20ml R2 2 x 20ml	CH9701
HDL Cholesterol (Liquid)	Phosphotung	4 x 80ml	CH203
HDL Cholesterol (Liquid, RX suzuka)	Clearance	R1 4 x 38.2ml R2 4 x 15.2ml	CH8033
LDL Cholesterol (Liquid)	Clearance	R1 3 x 2.5L R2 1 x 2.5L	CH1384
LDL Cholesterol (Liquid)	Clearance	R1 6 x 78ml R2 3 x 52ml	CH2657
LDL Cholesterol (Dimension)	Clearance	160 Tests	CH2850
LDL Cholesterol (Liquid), RX series)	Clearance	R1 3 x 51ml R2 3 x 20ml	CH3841
LDL Cholesterol (Synchron)	Clearance	540 tests	CH5731
LDL Cholesterol (Liquid)	Clearance	R1 5 x 20ml R2 2 x 20ml	CH9702
LDL Cholesterol (Liquid, RX suzuka)	Clearance	R1 4 x 19.2ml R2 4 x 8.2ml	CH8032
Extended Lipid Profile			
Apolipoprotein A-I (Liquid)	Immunoturbidimetric	R1 4 x 40ml R2 4 x 17ml	LP2116
Apolipoprotein A-I (Dimension)	Immunoturbidimetric	160 Tests	LP2866
Apolipoprotein A-I (Liquid)	Immunoturbidimetric	R1 4 x 60ml R2 4 x 36ml	LP2989
Apolipoprotein A-I (Liquid, RX series)	Immunoturbidimetric	R1 4 x 30ml	LP3838
Apolipoprotein A-I (Liquid, RX suzuka)	Immunoturbidimetric	R12x 10ml R2 2 x 4.9ml	LP8007
Apolipoprotein B (Liquid)	Immunoturbidimetric	R1 4 x 50ml R2 4 x 9ml	LP2117
Apolipoprotein B (Dimension)	Immunoturbidimetric	160 Tests	LP2867
Apolipoprotein B (Liquid)	Immunoturbidimetric	R1 4 x 60ml R2 4x15ml	LP2990
Apolipoprotein B (Liquid, RX series)	Immunoturbidimetric	R1 4 x 20ml R2 4 x 6ml	LP3839
Apolipoprotein B (Liquid, RX suzuka)	Immunoturbidimetric	R1 2 x 10ml R2 2 x 4.9ml	LP8008
Emerging Risk Factors			
High Sensitivity CRP	Immunoturbidimetric	R1 2 x 11ml R2 2 x 11ml	CP3885
High Sensitivity CRP (RX suzuka)	Immunoturbidimetric	R1 2 x 13ml R2 2 x 13ml	CP8029
Lipoprotein (a)	Immunoturbidimetric	R1 1 x 30ml R2 1 x 15ml	LP2757
Lipoprotein (a) Dimension	Immunoturbidimetric	160 Tests	LP2878
Lipoprotein (a)	Immunoturbidimetric	R1 1 x10ml R2 1 x 6ml	LP3403
sLDL Cholesterol	Clearance	R1 1 x 19.8ml R2 1 X 8.6ml	562616
Apolipoprotein A-II (Liquid, RX series)	Immunoturbidimetric	R1 2 x11ml R2 2 x 5ml	LP3867
Apolipoprotein C-II (Liquid, RX series)	Immunoturbidimetric	R1 2 x11ml R2 2 x 5ml	LP3866
Apolipoprotein C-III	Immunoturbidimetric	R1 2 x11ml	LP3865
Apolipoprotein E (Liquid, RX series)	Immunoturbidimetric	R1 2 x11ml R2 2 x 5ml	LP3864

aQusera

QUALITY CONTROL SOLUTIONS

Lipid Control

- 100% human serum
- Target values and ranges provided for both traditional precipitation methods
- Sodium Azide is not present therefore no interference with clearance methods
- Three levels available allowing assessment at low, borderline and high risk levels
- Reconstituted stability of seven days at +2 - 8°C or four weeks at -20°C

Analytes

• Apolipoprotein A-I • Apolipoprotein B • HDL Cholesterol
• LDL Cholesterol • Lipoprotein (a) • Total Cholesterol • Triglycerides

Apolipoprotein Control

• 100% human serum • Assayed values provided for four esoteric Apolipoproteins
• Reconstituted stability of up to 28 days at +2 - 8°C

Analytes

• Apolipoprotein A-II • Apolipoprotein C-II • Apolipoprotein C-III • Apolipoprotein E

sLDL Control

• Lyophilised for enhanced stability • 100% human serum • Reconstituted stability of five days at +2 - 8°C

High Sensitivity CRP Control

• Liquid ready-to-use • 100% human material • Open vial stability of 30 days at +2 - 8°C

RIQAS - Randox International Quality Assessment Scheme

RIQAS is the world's largest global EQA scheme with more than 20,000 participants in over 90 countries worldwide.

All Randox Lipid and Cardiac products are CE marked

RANDOX

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