SPECIMEN REPORT · NOT A PATIENT

The Bio-Audit.
A worked example.

The full report, exactly as it is written and delivered. Four systems, the findings and the reasoning behind them, what changes now, and the markers set for the next reading.

This is a composite. It is assembled from several assessments and describes no single person. Every figure is realistic and internally consistent, and none of it belongs to anybody. It is published so that you can judge the work before you buy it rather than after, and it is not medical advice to any reader.

Dr Ben Ingram

BSc MBBS MRCGP · GMC 7040877 · CQC registered

NHS GP Partner, PCN Clinical Director, Federation Co-Chair · Kent, London and the South East

THE POSITION

One system is holding *everything else back.*

A man of fifty-two, managing director of a manufacturing business, no diagnoses, no medication, and told at a company screen eighteen months ago that everything was normal. It was, against the questions that screen asked.

Across the fortnight and the two hours, four systems were measured. Two are in good order. One is drifting in a way that is silent, common at this age and entirely reversible at this stage. One carries an inherited risk that will not change, and that changes how hard we treat everything else.

The short version: **insulin resistance with early fatty liver is the governing constraint**, and it is upstream of the blood pressure, the sleep and a good part of how the afternoons feel. Separately and unrelated, **the particle count and an inherited lipoprotein put cardiovascular risk well above what the cholesterol number suggests.** Neither is an emergency. Both have a long window, and both windows are open now.

ACT NOW

Metabolic capacity

Fasting insulin and HOMA-IR raised with a normal HbA1c. Moderate hepatic steatosis on ultrasound. Post-lunch glucose excursions on nine of fourteen days.

ACT NOW

Cardiovascular reserve

ApoB high against a near-normal LDL cholesterol. Lp(a) raised, inherited, measured once. Early carotid plaque. Aerobic capacity below average for age.

WATCH

Endocrine regulation

Thyroid normal. Cortisol rhythm flattened rather than high. Testosterone at the low end, and secondary to the two systems above rather than a finding in its own right.

IN GOOD ORDER

Recovery and cognition

Sleep is short and interrupted, which is a behaviour rather than a disorder. Cognitive performance is intact across attention, working memory and executive function.

Nothing here was visible on the screen he had eighteen months ago.

That screen measured glucose, total cholesterol and blood pressure on one morning. Every finding in this report sits in the space between those three numbers and the questions they do not ask.

ACT NOW · THE GOVERNING CONSTRAINT

The glucose is normal. *The insulin holding it there is not.*

MEASURE	RESULT	READ AS
Fasting insulin	14.2 mU/L	Raised. Moves years before glucose does, and is almost never measured
HOMA-IR	3.1	Insulin resistance, established rather than borderline
HbA1c	39 mmol/mol	Normal, and the reason nobody has noticed
Liver ultrasound	Moderate steatosis	Fat in the liver, no fibrosis seen. Reverses
ALT	54 U/L	Mildly raised, consistent with the ultrasound
Continuous glucose, 14 days	Mean 5.6 mmol/L	Average is reassuring and hides the pattern below
Post-lunch excursions	9 of 14 days	Peaks to 9.8 mmol/L, all on office days, none at weekends
Waist to height	0.57	Above 0.5, which is where the risk curve turns

What this is

The pancreas is working considerably harder than it should to keep the glucose in a range that looks fine on paper. That extra work is invisible to every test that measures the result rather than the effort. The liver is storing the surplus, which is what the ultrasound shows, and the liver is usually the first organ to complain about this and the first to recover.

> WHY THIS IS THE FIRST FINDING, NOT THE THIRD
>
> It sits upstream of two other things in this report. Insulin resistance raises blood pressure through sodium handling and sympathetic tone, and it is worsened by short sleep, which is also present. Treating the blood pressure without this would be treating the readout. It is also the finding with the shortest distance between a change and a measurable response, which means we will know within twelve weeks whether it is working.

The pattern the average hides

A mean glucose of 5.6 is a good number. Underneath it, nine of fourteen days carried a post-lunch peak near 10, and all nine were office days. The weekend days, with a later and slower lunch, did not. That is not a diagnosis, it is a lead: the same body handled the same nutrient differently depending on what surrounded it. It gives us something specific to change rather than general advice about eating well.

ACT NOW · INDEPENDENT OF SYSTEM ONE

The cholesterol is unremarkable. *The particle count is not.*

MEASURE	RESULT	READ AS
LDL cholesterol	3.1 mmol/L	The number he has been shown, and told was fine
ApoB	1.28 g/L	High. Counts the particles that do the damage, not the fat they carry
Lp(a)	142 nmol/L	Raised. Inherited, fixed for life, measured once and never again
Carotid ultrasound	IMT 0.78 mm, small plaque	Disease is present and early. Not a surprise given the two rows above
24-hour blood pressure	Mean 138/86	Above target, and the daytime clinic reading understated it
Nocturnal dipping	4%	Non-dipper. Pressure barely falls overnight, which carries its own risk
VO_2 max, measured	32.4 ml/kg/min	Below average for age. Measured directly, not estimated from a formula

Why the two lipid numbers disagree

Cholesterol is cargo. ApoB counts the vehicles. A man can carry an ordinary amount of cargo in a large number of small vehicles, and it is the vehicles that lodge in an artery wall. Here the cargo reads mid-range and the vehicle count reads high, which is the discordance that a standard lipid panel is structurally unable to show. It is the single most common reason a well-looked-after man in his fifties is told every year that his cholesterol is fine.

> WHAT THE LP(A) CHANGES, AND WHAT IT DOES NOT
>
> Nothing shifts it. Not exercise, not diet, not weight. It is inherited, it costs a few pounds to measure, and it needs measuring exactly once in a life. What it changes is the threshold for everything else: with this result, the target for ApoB moves down and the argument for treating it moves from optional to firm. It also means his brother and his children have a reason to have theirs measured, which is a finding that leaves the room with him.

The plaque, stated plainly

There is early disease in the carotid artery. That is not a catastrophe and it is not nothing. It converts an argument about risk percentages into an observation about his own artery, and it means the question is no longer whether to treat but how hard. Plaque can be stopped from growing. That is the goal we set and the thing the next scan measures.

WATCH · AND WHAT IS ALREADY WORKING

Two systems where the right answer *is to do nothing yet.*

MEASURE	RESULT	READ AS
TSH / fT4 / fT3	2.1 / 15.4 / 4.6	Normal throughout. No thyroid explanation for the fatigue
Total testosterone	11.2 nmol/L	Low end of normal, with SHBG 22 and free testosterone low-normal
AM cortisol, diurnal slope	410 nmol/L, flattened	Not high. The shape of the day is blunted rather than the level being wrong
Sleep, 14 nights	6h04 mean, 78% efficiency	Short and broken. A pattern, not a disorder
Nocturnal HRV	28 ms	Low for age, and tracks the work nights rather than the weekends
Resting heart rate	62 rising to 68	Six beats higher on the five nights before a board meeting
Cognitive battery	Within expected range	Attention, working memory and executive function all intact

The testosterone result, and why it is not treated

A low-normal testosterone in a man with insulin resistance, central adiposity and six hours of broken sleep is usually a consequence rather than a cause. Treating it directly would move the number, feel like progress, and leave every mechanism that produced it untouched. It would also suppress his own production, which is a decision that is hard to reverse.

> THE STANDARD THIS IS HELD TO
>
> Three things have to be true before anything goes on the plan. A signal clear enough to be real. A change that is safe and reversible. And a direct way to verify the impact. Testosterone replacement here clears the first and fails the second. So it is not treated now. It is re-measured after the metabolic work and the sleep have had two seasons, and if it has not moved, it becomes a proper conversation with a proper reason behind it.

What the cognition result is worth

Nothing needs doing here, which is worth stating rather than leaving as an absence. He arrived believing his afternoons were a thinking problem. They are measurably not. They track the glucose excursions on the same days, and that is a far more tractable thing to fix than the one he was worried about.

IN ORDER

Four things, *and the order matters.*

Ranked by what moves the number, not by what is easiest to say. Each one names what to do, how hard, for how long, and what will show whether it worked.

1 ## Treat the particle count, and treat it properly

With early plaque and a raised Lp(a), the case for lipid-lowering treatment is firm rather than marginal, and the target is an ApoB below 0.8 g/L rather than a cholesterol inside a reference range. That is a conversation about a statin, the evidence behind it, the side effects people actually report and what we do if he gets them. Re-measure at twelve weeks. If ApoB has not moved far enough, the dose or the drug changes rather than the target.

2 ## Reverse the fatty liver, using the pattern we found

The lever is the office lunch and the eight hours around it, because that is where his own data shows the excursions. Protein and fibre first at that meal, a ten-minute walk inside thirty minutes of finishing, and resistance work twice a week for the muscle to put the glucose somewhere. Not a diet, three specific changes to one part of one day. ALT, fasting insulin and HOMA-IR at twelve weeks, and the ultrasound repeated at twelve months.

3 ## Give sleep a boundary, because two other findings depend on it

Six hours and four minutes is the ceiling on how far the insulin resistance and the blood pressure can improve. The target is seven hours in bed with a fixed rise time, defended on work nights rather than repaid at weekends. Nocturnal HRV and resting heart rate report on this every night without him doing anything, which makes it the easiest thing in this plan to verify.

4 ## Build aerobic capacity, deliberately

A VO_2 max of 32.4 is a modifiable number and one of the strongest predictors of long-term health we have. Three sessions a week, most of it easy and one of it hard, for six months. Re-measured directly, on the same equipment, at the annual reading. This is the slowest of the four to move and the one with the longest reach.

What is deliberately not here.

No supplement list. No full-body MRI, no microbiome panel, no epigenetic age clock, and no testosterone. Not because they are exotic, but because none of them would change what happens next for this man. A test that cannot change the plan is not medicine, it is decoration.

VERIFICATION

One reading is a position. *Two is a direction.*

Every action above has a marker attached to it, a date, and a stated direction. This is the page that makes the second reading mean something.

MARKER	NOW	TARGET	WHEN	
ApoB	1.28 g/L	< 0.80	12 weeks	ACT
Fasting insulin	14.2 mU/L	< 9	12 weeks	ACT
HOMA-IR	3.1	< 2.0	12 weeks	ACT
ALT	54 U/L	< 40	12 weeks	ACT
Sleep duration	6h04	> 7h in bed	Nightly	ACT
24-hour blood pressure	138/86, 4% dip	< 130/80, dipping	6 months	WATCH
Liver ultrasound	Moderate steatosis	Reduced or clear	12 months	WATCH
VO_2 max	32.4	> 38	12 months	WATCH
Carotid IMT and plaque	0.78 mm, small plaque	No progression	24 months	WATCH
Total testosterone	11.2 nmol/L	Reassess in context	6 months	WATCH
Lp(a)	142 nmol/L	Fixed for life	Never again	DONE
Thyroid panel	Normal	No action	Annual	CLEAR

Twelve weeks is the first honest checkpoint.

Four of these markers move inside three months if the plan is being followed, and stay still if it is not. That is deliberate. It means the first review is a measurement rather than a conversation about how it has been going.

Some people take this report to their own GP and run it themselves, which is a fair use of it and it stands on its own. Others want the markers above watched through the year rather than filed, with a written note each quarter and an agreed threshold at which the doctor makes contact. That is a separate arrangement and a conversation for after the report, not before it.

HOW TO READ THIS DOCUMENT

What this is, *and what it is not.*

What was measured

Fourteen days of continuous sleep, heart rate variability and glucose monitoring through an ordinary working fortnight. Then two hours in person: fasting bloods, a full examination, directly measured VO_2 max, a 12-lead ECG, blood pressure on both arms, 24-hour ambulatory blood pressure, ultrasound of the carotid arteries and the liver, body composition, grip strength, gait speed and sit-to-stand, and a cognitive battery across attention, working memory and executive function.

What it cannot do

It does not prevent anything, and nothing in it should be read as a promise that it will. It measures where a person stands and which way they are going, early enough that there is room to change the direction. Some things it will not find. A normal result today is a statement about today.

The evidence standard

Every measurement earns its place against three tests. A signal clear enough to be real. A change that is safe and reversible. And a direct way to verify the impact. If a result cannot clear all three, it is not ordered, however interesting it would be. The list is reviewed once a year and dated, because a claim that it evolves with no record of evolution is decoration.

No markup on anything

The fee covers the doctor's time and judgment. Where a finding needs a test beyond the set, the cost is stated before anything is booked and it passes through at exactly what it costs. The same is earned whether a man is investigated or reassured, which is the point.

The company can pay. The report is yours.

No result, no finding, no summary and no record of attendance reaches a firm at any point, whoever settles the invoice. What the company gets is the knowledge that it happened. A governance report on an individual's health is the wrong instrument, and removing it is why the person in the room has no reason to hold anything back.

About this specimen. It is a composite, assembled from several assessments so that the shape of a real report can be shown without any real person appearing in it. The figures are realistic and internally consistent. They belong to nobody. Nothing in this document is medical advice to any reader, and no one should act on it for themselves. A real report is written for one person, after measuring that person.

Dr Ben Ingram

BSc MBBS MRCGP · GMC 7040877 · CQC registered independent practice

NHS GP Partner, PCN Clinical Director, Co-Chair of the Medway and Swale GP Federation

01795 358853 · drbeningram.com