Question from the Clinic: In addition to the labs that are considered "best practice" for all persons with diabetes, what OTHER labs do you find useful for diabetes management?

ADA Recommended Labs[1]	Frequency After Initial Visit/Assessment
HbA1C	Every follow up visit
Lipid Profile: LDL, HDL, TG	Annually in persons with dyslipidemia and after initiation or medication dose changes
Liver Function Tests AST/ALT and FIB-4 Index	Annually and after initiation or medication dose changes FIB-4 – calculated from age, AST/ALT and platelet count
Kidney Function Tests: • Serum creatinine and eGFR • Urine albumin-to-creatinine ratio	Annually – or more frequently in CKD or with changes in medications that affect kidney function Urine: if elevated, collect again in 3 months to confirm
Serum Potassium	Annually or more in persons with CKD, or taking ACE-inhibitors, ARBs, or diuretics
CBC with platelets	Annually
Vitamin B12	Annually for persons taking metformin for > 5 years
Calcium, Vitamin D, phosphorous	Annually when appropriate
TSH	Persons with Type 1 diabetes: Annually and after initiation or medication dose changes

Useful Labs to help differentiate type of diabetes and to better target treatment strategies:

<table>
<tr><th>Lab</th><th>Usefulness in Diabetes Management:</th></tr>
<tr><td></td><td></td></tr>
<tr><td>C-Peptide</td><td>Very low levels indicate a lack of insulin production by beta cells. Can be helpful to diagnose Type 1 diabetes or LADA (Latent-Autoimmune-Diabetes-of-Adulthood).</td></tr>
<tr><td>GAD-antibodies</td><td>High levels Indicate Type 1 diabetes: Autoimmune disease
GAD is the primary antibody measured; can also use IA-2 and/or ZnT8 where available[2]</td></tr>
<tr><td>Fasting Insulin Test[3-5]
(goal < 15)</td><td>Helpful to monitor INSULIN RESISTANCE, hypoglycemia or variant diabetes[3-5]
Use with a glucose level drawn at the same time to calculate a HOMA-IR Score:
(Fasting insulin x fasting glucose)/22.5 = HOMA-IR
<table>
<tr><th>HOMA-IR Test Score</th><th>Interpretation</th></tr>
<tr><td>< 1</td><td>Insulin Sensitive</td></tr>
<tr><td>1-2.9</td><td>Insulin Resistance</td></tr>
<tr><td>> 2.9</td><td>Significant Insulin Resistance</td></tr>
</table></td></tr>
<tr><td>Fructosamine[6]
(Instead of A1C)</td><td>Measures the amount of glucose attached to proteins in the blood to assess glucose changes in the past 2-4 weeks (vs 3-4 months for an A1C based on life of erythrocytes)
Can be used in place of A1C when there is a need to respond more quickly to therapy changes (pre-surgery, pregnancy), or when A1C is not accurate due to erythrocyte disorders (chronic anemia, major blood loss, hemolysis, uremia, pregnancy, smoking, and various infections)
<table>
<tr><th>Glucose (mg/dL)</th><th>Fructosamine (µmol)</th><th>A1C %</th></tr>
<tr><td>97</td><td>212.5</td><td>5</td></tr>
<tr><td>126</td><td>250</td><td>6</td></tr>
<tr><td>154</td><td>287.5</td><td>7</td></tr>
<tr><td>183</td><td>325</td><td>8</td></tr>
<tr><td>212</td><td>362.5</td><td>9</td></tr>
<tr><td>240</td><td>400</td><td>10</td></tr>
<tr><td>269</td><td>437.5</td><td>11</td></tr>
</table></td></tr>
</table>

References:

1. American Diabetes Association Professional Practice Committee; 4. Comprehensive Medical Evaluation and Assessment of Comorbidities: Standards of Care in Diabetes—2025. *Diabetes Care* 1 January 2025; 48 (Supplement_1): S59–S85. https://doi.org/10.2337/dc25-S004
2. American Diabetes Association Professional Practice Committee; 2. Diagnosis and Classification of Diabetes: Standards of Care in Diabetes—2025. *Diabetes Care* 1 January 2025; 48 (Supplement_1): S27–S49. https://doi.org/10.2337/dc25-S002
3. González-González JG, Violante-Cumpa JR, Zambrano-Lucio M, Burciaga-Jimenez E, Castillo-Morales PL, Garcia-Campa M, Solis RC, González-Colmenero AD, Rodríguez-Gutiérrez R. HOMA-IR as a predictor of Health Outcomes in Patients with Metabolic Risk Factors: A Systematic Review and Meta-analysis. High Blood Press Cardiovasc Prev. 2022 Nov;29(6):547-564. doi: 10.1007/s40292-022-00542-5. Epub 2022 Oct 1. PMID: 36181637.
4. HOMA-IR: https://www.mdcalc.com/calc/3120/homa-ir-homeostatic-model-assessment-insulin-resistance#when-to-use
5. https://www.sciencedirect.com/topics/medicine-and-dentistry/homeostatic-model-assessment#:~:text=HOMA%2DIR%20values%20between%200.5,%2Dcell%20function%20%5B157%5D.
6. Nathan DM, et al. (2008). "Translating the A1C Assay Into Estimated Average Glucose Values." *Diabetes Care*, 31(8):1473-1478. (DOI: 10.2337/dc08-0545)