Patient 4. Cognition test other than ADAS COG, MRI scan, genetic tests, recently quit smoking. Prescribed Aricept.

**Medical Conditions**

Epilepsy since age 29

Alzheimer’s Disease

Hypertension

**Medications**

Tegretol (Carbamazepine) 400mg tid

Donepezil 10mg od

Carvedilol 6.25md bid

**Pharmacogenomic Data**

“SERIOUS DERMATOLOGIC REACTIONS AND HLA-B\*1502 ALLELE.” “Prior to initiating Tegretol therapy, testing for HLA-B\*1502 should be performed in patients with ancestry in populations in which HLA-B\*1502 may be present.In deciding which patients toscreen, the rates provided above for the prevalence of HLA-B\*1502 may offer a rough guide, keepingin mind the limitations of these figures due to wide variability in rates even within ethnic groups, thedifficulty in ascertaining ethnic ancestry, and the likelihood of mixed ancestry. Tegretol should not beused in patients positive for HLA-B\*1502 unless the benefits clearly outweigh the risks. Testedpatients who are found to be negative for the allele are thought to have a low risk of SJS/TEN (see **WARNINGS** and **PRECAUTIONS/Laboratory Tests**).” ”For genetically at-risk patients (See WARNINGS), high-resolution ‘HLA-B\*1502 typing’ is recommended. The test is positive if either one or two HLA-B\*1502 alleles are detected and negativeif no HLA-B\*1502 alleles are detected.”

**Urea cycle disorders** – “Prior to the initiation of valproate therapy, evaluation for UCD should be considered.” - Not an option in this patient! Patient is positive for this variation

1A2



2C8

CARVEDILOL - major



2C9

CARVEDILOL - major



2C19



2D6

CARVEDILOL – unclassified substrate

DONEPEZIL substrate



3A4 -

DONEPEZIL substrate



**Genetic Biomarker Associations**

Implicated Biomarkers In Alzheimer’s Disease

T – Tau Presence

P –Tau Absence

AB42 Absence

APOE B4 Presence

**This Fake Patient’s Values are in the Far Right Column**

**Electrolytes and Metabolytess**

|  |  |  |
| --- | --- | --- |
| **Test** | **Range** | **Comments** |
| [Sodium](http://july.fixedreference.org/en/20040724/wikipedia/Sodium) (Na) | 130 - 145 mmol/L |  140 |
| [Potassium](http://july.fixedreference.org/en/20040724/wikipedia/Potassium) (K) | 3.5 - 5.0 mmol/L | 4 |
| [Urea](http://july.fixedreference.org/en/20040724/wikipedia/Urea) | 2.6 - 6.8 mmol/L | 6 |
| [Creatinine](http://july.fixedreference.org/en/20040724/wikipedia/Creatinine) | 50 - 110 μmol/L | 102 |
| [Glucose](http://july.fixedreference.org/en/20040724/wikipedia/Glucose) (fasting) | 4.2 - 6.1 mmol/L | 6 |

**Liver function tests**

|  |  |  |
| --- | --- | --- |
| Total Protein | 60 - 80 g/L | 69 |
| [Albumin](http://july.fixedreference.org/en/20040724/wikipedia/Albumin) | 30 - 50 g/L | 38 |
| Total [Bilirubin](http://july.fixedreference.org/en/20040724/wikipedia/Bilirubin) | 2 - 14 μmol/L | 13 |
| Direct Bilirubin | 0 - 4 μmol/L | 2 |
| [Alanine transaminase](http://july.fixedreference.org/en/20040724/wikipedia/Alanine_transaminase) (ALT) | 8 - 40 U/L | 50 |
| Alkaline phosphatase (ALP) | 40 - 130 U/L | 120 |
| Gamma glutamyl transferase | < 50 U/L | 234 |

**Other enzymes and proteins**

|  |  |  |
| --- | --- | --- |
| [Creatine kinase](http://july.fixedreference.org/en/20040724/wikipedia/Creatine_kinase) (CK) | 22 - 198 U/L | 66 |
| Aspartate transaminase (AST) | 8 - 35 U/L | 36 |
| [Lactate dehydrogenase](http://july.fixedreference.org/en/20040724/wikipedia/Lactate_dehydrogenase) (LDH) | 85 - 285 U/L | 201 |
| [Amylase](http://july.fixedreference.org/en/20040724/wikipedia/Amylase) | 25 - 125 U/L | 90 |
| [C-reactive protein](http://july.fixedreference.org/en/20040724/wikipedia/C-reactive_protein) (CRP) | <8 mg/L | 5 |

**Other ions and trace metals**

|  |  |  |
| --- | --- | --- |
| Ionised [calcium](http://july.fixedreference.org/en/20040724/wikipedia/Calcium) (Ca) | 1.15 - 1.29 mmol/L |  1.01   |
| Total calcium (Ca) | 2.05 - 2.55 mmol/L | 2.09 |
| [Copper](http://july.fixedreference.org/en/20040724/wikipedia/Copper) (Cu) | 11 - 26 μmol/L |  |
| [Zinc](http://july.fixedreference.org/en/20040724/wikipedia/Zinc) (Zn) | 10 - 17 μmol/L |  |

**Lipids**

|  |  |  |
| --- | --- | --- |
| [Triglycerides](http://july.fixedreference.org/en/20040724/wikipedia/Triglyceride) | 0.4 - 2.0 mmol/L | 2.6 |
| Total [cholesterol](http://july.fixedreference.org/en/20040724/wikipedia/Cholesterol) | 3.0 - 5.5 mmol/L | 5 |
| [HDL cholesterol](http://july.fixedreference.org/en/20040724/wikipedia/High_density_lipoprotein) (male) | 0.7 - 1.9 mmol/L | 1 |
| (female) | 0.9 - 2.4 mmol/L |  |
| [LDL cholesterol](http://july.fixedreference.org/en/20040724/wikipedia/Low_density_lipoprotein) | 2.4 - 4.0 mmol/l | 4 |

**Tumour markers**

|  |  |  |
| --- | --- | --- |
| [Alpha-fetoprotein](http://july.fixedreference.org/en/20040724/wikipedia/Alpha-fetoprotein) (AFP) | 1-15 kIU/L |  |
| CA-125 | <65 kU/L |  |
| [Prostate specific antigen](http://july.fixedreference.org/en/20040724/wikipedia/Prostate_specific_antigen) (total PSA) | <2.0 μg/L | 3  |

**Hormones**

|  |  |  |
| --- | --- | --- |
| [Thyroid stimulating hormone](http://july.fixedreference.org/en/20040724/wikipedia/Thyroid-stimulating_hormone) (TSH) | 0.5 - 4.7 mIU/L | 3 |
| Free [thyroxine](http://july.fixedreference.org/en/20040724/wikipedia/Thyroid_hormone) (FT4) | 9.0 - 24 pmol/L | 21 |
| Free [triiodothyronine](http://july.fixedreference.org/en/20040724/wikipedia/Thyroid_hormone) (FT3) | 2.5 - 5.3 pmol/L | 5 |
| [Adrenocorticotropic hormone](http://july.fixedreference.org/en/20040724/wikipedia/Adrenocorticotropic_hormone) (ACTH) | 1.3 - 15 pmol/L | 4 |
| [Cortisol](http://july.fixedreference.org/en/20040724/wikipedia/Cortisol) (0830 h) | 250 - 850 nmol/L | 500 |
| Cortisol (1630 h) | 110 - 390 nmol/L |  |
| [Prolactin](http://july.fixedreference.org/en/20040724/wikipedia/Prolactin) (male) | <450 mIU/L |  |
| (female) | <580 mIU/L |  |
| [Testosterone](http://july.fixedreference.org/en/20040724/wikipedia/Testosterone) (male) | 8 - 38 nmol/L |  |
| (male prepuberty) | 0.1 - 0.5 nmol/L |  |
| (female) | 0.3 - 2.5 nmol/L |  |

**Haematology**

**Red blood cells**

|  |  |  |
| --- | --- | --- |
| [Haemoglobin](http://july.fixedreference.org/en/20040724/wikipedia/Hemoglobin) (Hb) (male) | 130 - 180 g/L | 140 |
| (female) | 115 - 160 g/L | Sex difference negligible until adulthood. |
| [Haematocrit](http://july.fixedreference.org/en/20040724/wikipedia/Hematocrit) (Hct) (male) | 0.38 - 0.52 |  |
| (female) | 0.35 - 0.47 |  |
| Mean cell volume (MCV) | 80 - 98 fL | 90 |
| Mean cell haemoglobin (MCH) | 26 - 34 pg | 30 |
| Red cell count (male) | 4.5 - 6.5 x1012/L | 5 |
| (female) | 3.8 - 5.8 x1012/L |  |
| Reticulocytes | 10 - 100 x109/L | 20 |
| [Erythrocyte](http://july.fixedreference.org/en/20040724/wikipedia/Erythrocyte_sedimentation_rate)[sedimentation rate](http://july.fixedreference.org/en/20040724/wikipedia/Erythrocyte_sedimentation_rate) (ESR) |  | 13 |

**White blood cells**

|  |  |  |
| --- | --- | --- |
| Total white blood cells | 4.0 - 11.0 x109/L | 6 |
| Neutrophil granulocytes | 2.0 - 7.5 x109/L | 7 |
| [Lymphocytes](http://july.fixedreference.org/en/20040724/wikipedia/Lymphocyte) | 1.0 - 4.0 x109/L | 2 |
| Monocytes | 0.0 - 0.8 x109/L | 0.4 |
| Eosinophil granulocytes | 0.0 - 0.5 x109/L | 0.4 |
| Basophil granulocytes | 0.0 - 0.2 x109/L | 0.1 |

**Coagulation**

|  |  |  |
| --- | --- | --- |
| [Prothrombin time](http://july.fixedreference.org/en/20040724/wikipedia/International_normalized_ratio) (PT) | 7 - 10 s | 11 |
| [INR](http://july.fixedreference.org/en/20040724/wikipedia/International_normalized_ratio) | 0.8 - 1.2 | 1.1 |
| Activated partial thromboplastin time (APTT) | 29 - 41 s |  |
| Thrombin clotting time (TCT) | 11 - 18 s |  |
| [Fibrinogen](http://july.fixedreference.org/en/20040724/wikipedia/Fibrin) | 1.8 - 4.0 g/L | 3 |
| [Bleeding time](http://july.fixedreference.org/en/20040724/wikipedia/Bleeding_time) | 2 - 8 minutes | 6 |

**Immunology**

|  |  |  |
| --- | --- | --- |
| Antinuclear antibodies (ANA) |  | Not Indicated |
| Extractable nuclear antigen (ENA) |  | Not Indicated |

Toxicology

Carbamazepine Levels (normal therapeutic level 4-12 mcg/ml) Patient level = 6