

NHANES 1999-2000 DATA USED TO CREATE COMPREHENSIVE HEALTH-ASSOCIATED ADOLESCENT REFERENCE INTERVALS FOR 21 CHEMISTRY ANALYTES MEASURED BY THE HITACHI 704

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NHANES 1999-2000 is a subset of the ongoing 1999-2004 National Health and Nutrition Examination Survey which is being conducted on civilian noninstitutionalized individuals. Approximately 1500 individuals, ages 12 to 18 y had their blood drawn after fasting. The Hitachi 704 (Boehringer Mannheim Diagnostics, Indianapolis, IN) was used to measure ALT, albumin, ALP, AST, bicarbonate, urea nitrogen, calcium, cholesterol, creatinine, GGT, glucose, iron, LDH, phosphorus, sodium, potassium, chloride, total bilirubin, total protein, triglycerides and uric acid. The NHANES data were abstracted with Microsoft Access (Redmond, WA) and analyzed with Microsoft Excel. To determine health-associated reference intervals, we used the following exclusion criteria: pregnancy, obesity (body mass index >30), diastolic blood pressure > 100 mm Hg, creatinine exceeding 2.5 mg/dL and glucose exceeding 126 mg/dL. The population was separated in to 6 categories, Female NonHispanic White (FNHW, n=159), Female NonHispanic Black (FNHB, 191), Female Mexican American (FMA, 310), Male NonHispanic White (MNHW, 170), Male NonHispanic Black (MNHNB, 221) and Male Mexican American (MMA, 358), and finally by age groupings: ages 12 to 15, 16 to 18 years. The table compares the reference intervals for tests associated with liver function for the 12 to 15 y subjects. When compared to Soldin's [Pediatric Reference Ranges](#), the NHANES pediatric upper limit of LD is lower, the male upper limit for bilirubin is higher and the total protein upper limits are better explained by the inter-racial differences found in this study. Interestingly, white female ALTs and GGTs are lower than the other groups and the male Mexican American had higher ALTs and ASTs. These NHANES data should enhance the interpretation of laboratory results of adolescent patients, especially those of non-white ethnicity.

	Percentile	ALT (U/L)	Albumin (g/L)	ALP (U/L)	AST (U/L)	GGT (U/L)	LD (U/L)	Bilirubin(umol/L)	TP (g/L)
FNHW	2.5	10	40	66	15	7	113	5.1	70
FNHW	97.5	25	50	463	33	17	212	18.3	82
FNHB	2.5	9	41	62	15	8	104	3.4	69
FNHB	97.5	37	51	396	40	29	230	20.3	87
FMA	2.5	9	42	62	14	6	107	5.1	70
FMA	97.5	35	52	346	34	23	198	17.1	84
MNHW	2.5	12	43	137	18	8	119	5.1	68
MNHW	97.5	29	51	562	43	21	254	25.1	82
MNHNB	2.5	9	42	108	17	8	127	3.4	71
MNHNB	97.5	34	51	535	40	36	286	22.2	86
MMA	2.5	10	44	108	16	9	116	5.1	69
MMA	97.5	54	53	526	46	27	249	25.7	84