

Report from the working group on creatinin and urea

Members:

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Methods:

The reference intervals suggested for the serum components creatinin and urea presented in this report, were based on data obtained from the NORIP database. The results were compared with the preliminary intervals reported by NORIP. Identification of subgroups was performed according to the suggestions published in by Lahti *et al.*, Clin Chem, 2002 Feb; 48(2): 338-52. Partitioning was judged as suggested by these authors.

The data were imported from NORIP's database to an Excel spreadsheet and the statistical software Analyze-it was used to elaborate results. In some cases numbers were deleted due to lacking information on e.g. sex, and since NORIP had worked on the data and traced outliers, no data were deleted as such.

The distributions were with a few exceptions non-normal, and attempts to transform these by \log_{10} , log-log, or ln, failed. The 2,5-25-50-75-97,5 percentiles were calculated, and reference intervals could be checked by using a software option claimed to be in agreement with IFCC criteria.

Subgroups were questioned as a result of these factors: Alcohol, BMI, Drugs, Fasting, Diabetes, Height, Weight, Ethnicity, Physical activity, Smoking, Lab-methods, Gender, and Age. These tasks were given in advance. The significance of height and weight was judged by correlation. In some cases the numbers in a group reflected too few individuals (<120) and it could thereby not be considered whether partitioning should be done.

NORIP

Suggested reference interval for creatinin in serum

Subject: Gender and Age
Reference interval(s) suggested by Norip:

	Low	High
Both gender:	52	94
Female (all):	51	83
Female < 50:	50	81
Female ≥ 50:	51	87
Male (all):	63	99
Male < 50:	63	96
Male ≥ 50:	62	102

Distribution in main and subgroups:

Percentiles	2,5	25	50	75	97,5	n	Partitioning?
All	52,4	64,1	70,7	78,5	94,3	2636	No
Female	50,5	60,7	65,1	69,9	82,8	1391	Yes
Female≥50	50,8	60,8	65,8	70,9	86,7	774	No
Female<50	50,2	60,5	64,6	69,2	81,6	617	No
Male	62,6	72,4	77,6	84,2	98,9	1243	No
Male≥50	62,0	73,0	78,6	86,0	101,8	567	No
Male<50	62,9	71,9	76,7	82,2	96,1	676	No

Comments to the distributions:

It was searched for subgroups generated by factors: Alcohol, BMI, Drugs, Fasting, Diabetes, Height, Weight, Ethnicity, Physical activity, Smoking, Lab-methods.

Gender partitioning is recommended, age partitioning could not be recognised.

Subgroup = diabetic males, however, since diabetes is a disease, this subgroup should not be considered.

Other comments:

The intervals suggested by NORIP are identical with those found here, except for female <50, NORIP's upper limit is 81, ours is 81,6. It is a question whether age-partitioning should be recommended since the differences between the intervals are small, e.g. upper reference for female <50 compared to female ≥50 are 81 and 87, respectively. Creatinin levels are diet-dependant, and there is an intra-individual variance during the day, up to 30% higher, as reported in the literature.

Suggested reference intervals:

Those suggested by NORIP, but with reservation to age-partitioning.

NORIP

Suggested reference interval for urea in serum

Subject: Gender and Age

Reference interval(s) suggested by NORIP:

	Low	High
Both gender:	2,9	7,8
Female (all):	2,7	7,4
Female < 50:	2,7	6,4
Female \geq 50:	3,1	8,0
Male (all):	3,3	8,2
Male < 50:	3,2	7,7
Male \geq 50:	3,6	8,5

Distribution in main and subgroups:

Percentiles	2,5	25	50	75	97,5	n	Normal distr. (+/-)	Partitioning?
All	2,89	4,11	4,89	5,78	7,84	2533	-	Marginal
Female	2,73	3,81	4,47	5,23	7,42	1346	-	Marginal
Female<50	2,63	3,59	4,17	4,81	6,40	761	-	Marginal
Female \geq 50	3,12	4,27	4,96	5,89	7,92	585	-	Marginal
Male	3,33	4,60	5,38	6,25	8,16	1185	-	Marginal
Male<50	3,24	4,46	5,16	5,93	7,68	649	-	Marginal
Male \geq 50	3,64	4,86	5,68	6,54	8,48	536	-	Marginal

Comments to the distributions:

All non-normal distributions, only partitioning based on age <50 years and \geq 50 years has been considered, NORIP found a subgroup \geq 70 (female and male).

Other comments:

Effects of the following have been considered: Gender, Age, Alcohol, BMI,, Drugs, Fasting, Diabetes, Height, Weight, Ethnicity, Physical activity, Smoking, Lab-methods.

Suggested reference intervals:

It is suggested that the reference intervals established by NORIP should be used.

These are in agreement with those found here, except for subgroups aged \geq 70 that were not considered here.

Comments to suggested reference intervals:

Partitioning criteria were all marginal here, this should be tested by using the software Refval 4.0