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Dataset Integrity Check for the Assessing Long Term Outcomes of Living Kidney Donors (ALTOLD) Data Files

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Contents

1 Standard Disclaimer

The intent of this DSIC is to provide confidence that the data distributed by the NIDDK repository is a true copy of the study data. Our intent is not to assess the integrity of the statistical analyses reported by study investigators. As with all statistical analyses of complex datasets, complete replication of a set of statistical results should not be expected in secondary analysis. This occurs for a number of reasons including differences in the handling of missing data, restrictions on cases included in samples for a particular analysis, software coding used to define complex variables, etc. Experience suggests that most discrepancies can ordinarily be resolved by consultation with the study data coordinating center (DCC), however this process is labor-intensive for both DCC and Repository staff. It is thus not our policy to resolve every discrepancy that is observed in an integrity check. Specifically, we do not attempt to resolve minor or inconsequential discrepancies with published results or discrepancies that involve complex analyses, unless NIDDK Repository staff suspect that the observed discrepancy suggests that the dataset may have been corrupted in storage, transmission, or processing by repository staff. We do, however, document in footnotes to the integrity check those instances in which our secondary analyses produced results that were not fully consistent with those reported in the target publication.

2 Study Background

Understanding the pathophysiological effects of kidney donation is important for judging donor safety and for improving our understanding of the consequences of reduced kidney function in chronic kidney disease. In this prospective observational cohort study, donors and controls were enrolled before donation. Donors and controls were required to complete a pre-donation visit, and visits at 6, 12, 24, and 36 months after donation. Kidney donors manifest several of the findings of mild chronic kidney disease. However, at 36 months after donation, kidney function continues to improve in donors while controls have expected age-related declines in function.

3 Archived Datasets

All SAS data files, as provided by the Data Coordinating Center (DCC), are located in the Data folder in the ALTOLD data package. For all tables, variables were taken from the 'data_crf.sas7bdat', 'abpm.sas7bdat', 'slope_calculation.sas7bdat', and 'data_results.sas7bdat' datasets.

4 Statistical Methods

Analyses were performed to duplicate results for the data published by Kasiske et al in the American Journal of Kidney Disease in 2015 [1].

To verify the integrity of the datasets, descriptive statistics were computed.

5 Results

For Table 1 in the publication [1], Heart rate and blood pressure, Table A lists the variables that were used in the replication and Table B compares the results calculated from the archived data files to the results published in Table 1. The results of the replication are similar to the published results.

For Table 2 in the publication [1], Twenty-four hour ambulatory blood pressure results at 36 months, Table C lists the variables that were used in the replication and Table D compares the results calculated from the archived data files to the results published in Table 2. The results of the replication are almost an exact match to the published results.

For Table 3 in the publication [1], Kidney function at 6, 12, 24, and 36 months after kidney donation, Table E lists the variables that were used in the replication and Table F compares the results calculated from the archived data files to the results published in Table 3. The results of the replication are similar to the published results.

For Table 4 in the publication [1], Changes in kidney function over time, Table G lists the variables that were used in the replication and Table H compares the results calculated from the archived data files to the results published in Table 4. The results of the replication are similar to the published results.

For Table 5 in the publication [1], Lack of association of age with changes in kidney function in donors and controls, Table I lists the variables that were used in the replication and Table J compares the results calculated from the archived data files to the results published in Table 5. The results of the replication are similar to the published results.

For Table 6 in the publication [1], Laboratory measurements at 6, 12, 24, and 36 months after kidney donation, Table K lists the variables that were used in the replication and Table L compares the results calculated from the archived data files to the results published in Table 6. The results of the replication are similar to the published results.

6 Conclusions

The NIDDK repository is confident that the ALTOLD data files to be distributed are a true copy of the study data.

7 References

[1] Kasiske, B.L., Anderson-Haag, T., Israni, A.K., Kalil, R.S., Kimmel, P.L., Kraus, E.S., Kumar, R., Posselt, A.A., Pesavento, T.E., Rabb, H., Steffes, M.W., Snyder, J.J., and Weir, M.R. A Prospective Controlled Study of Living Kidney Donors: Three-Year Follow-up. Am J Kidney Dis (2015); 66(1) 114-124.

Table A: Variables used to replicate Table 1: Heart rate and blood pressure

Characteristic	**dataset.variable**
Heart rate	data_crf.p1, data_crf.p2, data_crf.p3
Systolic BP	data_crf.sys1, data_crf.sys2, data_crf.sys3
Diastolic BP	data_crf.dia1, data_crf.dia2, data_crf.dia3
Pulse pressure	data_crf.sys1, data_crf.sys2, data_crf.sys3, data_crf.dia1, data_crf.dia2, data_crf.dia3
Donor vs. Control	data_results.donor
Visit	data_crf.visit

Table B: Comparison of values computed in integrity check to reference article Table 1 values

Test	Group	6 Mo Manuscript	6 Mo DSIC	Diff.	12 Mo Manuscript	12 Mo DSIC	Diff.
Heart Rate (bpm)	Controls	66.3 ± 10.0 (198)	66.2 ± 10.0 (200)	0.1 ± 0 (2)	66.6 ± 10.3 (193)	66.5 ± 10.4 (193)	0.1 ± 0.1 (0)
	Donors	66.3 ± 9.6 (200)	65.2 ± 11.5 (201)	1.1 ± 1.9 (1)	66.6 ± 9.5 (196)	66.3 ± 10.6 (197)	0.3 ± 1.1 (1)
Systolic BP (mm Hg)	Controls	115.7 ± 12.2 (198)	115.8 ± 12.1 (200)	0.1 ± 0.1 (2)	116.2 ± 11.8 (193)	116.2 ± 11.8 (193)	0 ± 0 (0)
	Donors	115.2 ± 11.3 (200)	114.4 ± 14.3 (201)	0.8 ± 3.0 (1)	116.4 ± 12.4 (196)	115.8 ± 14.9 (196)	0.6 ± 2.5 (0)
Diastolic BP (mm Hg)	Controls	70.0 ± 8.5 (198)	70.0 ± 8.5 (200)	0 ± 0 (2)	70.1 ± 9.0 (193)	70.1 ± 9.0 (193)	0 ± 0 (0)
	Donors	70.4 ± 8.5 (200)	69.9 ± 9.9 (201)	0.5 ± 1.4 (1)	70.3 ± 8.6 (196)	70.0 ± 9.9 (197)	0.3 ± 1.3 (1)
Pulse Pressure (mm Hg)	Controls	45.7 ± 8.8 (198)	45.8 ± 8.8 (200)	0.1 ± 0 (2)	46.2 ± 8.4 (193)	46.1 ± 8.4 (193)	0.1 ± 0 (0)
	Donors	44.8 ± 8.2 (200)	44.5 ± 8.9 (201)	0.3 ± 0.7 (1)	46.1 ± 8.6 (196)	45.9 ± 9.2 (196)	0.2 ± 0.6 (0)

Test	Group	24 Mo Manuscript	24 Mo DSIC	Diff.	36 Mo Manuscript	36 Mo DSIC	Diff.
Heart Rate (bpm)	Controls	67.0 ± 9.3 (180)	65.9 ± 12.1 (182)	1.1 ± 2.8 (2)	66.7 ± 9.7 (169)	65.0 ± 14.5 (172)	1.7 ± 4.8 (3)
	Donors	66.9 ± 10.0 (184)	66.3 ± 11.6 (185)	0.6 ± 1.6 (1)	66.6 ± 9.2 (181)	66.6 ± 9.2 (181)	0 ± 0 (0)
Systolic BP (mm Hg)	Controls	117.2 ± 13.3 (180)	115.9 ± 18.0 (182)	1.3 ± 4.7 (2)	117.3 ± 12.8 (170)	115.3 ± 19.9 (173)	2.0 ± 7.1 (3)
	Donors	116.2 ± 11.6 (184)	115.5 ± 14.4 (185)	0.7 ± 2.8 (1)	117.5 ± 12.0 (182)	117.5 ± 12.0 (182)	0 ± 0 (0)
Diastolic BP (mm Hg)	Controls	71.0 ± 9.1 (180)	70.2 ± 11.7 (182)	0.8 ± 2.6 (2)	71.6 ± 8.5 (170)	70.4 ± 12.6 (173)	1.2 ± 4.1 (3)

Test	Group	24 Mo Manuscript	24 Mo DSIC	Diff.	36 Mo Manuscript	36 Mo DSIC	Diff.
	Donors	70.7 ± 8.3 (184)	70.3 ± 9.8 (185)	0.4 ± 1.5 (1)	72.1 ± 8.4 (182)	72.1 ± 8.4 (182)	0 ± 0 (0)
Pulse Pressure (mm Hg)	Controls	46.2 ± 9.7 (180)	45.7 ± 10.8 (182)	0.5 ± 1.1 (2)	45.7 ± 8.7 (170)	44.9 ± 10.5 (173)	0.8 ± 1.8 (3)
	Donors	45.5 ± 8.4 (184)	45.2 ± 9.0 (185)	0.3 ± 0.6 (1)	45.4 ± 8.9 (182)	45.4 ± 8.9 (182)	0 ± 0 (0)

Table C: Variables used to replicate Table 2. Twenty-four hour ambulatory blood pressure results at 36 months

Characteristic	**dataset.variable**
Duration of recording (h)	abpm.duration
No. of measurements	abpm.success
Systolic BP (mm Hg)	abpm.avgsys
Diastolic BP (mm Hg)	abpm.avgdia
MAP (mm Hg)	abpm.avgmap
Pulse pressure (mm Hg)	abpm.avgpp
Heart rate (bpm)	abpm.avghr
Systolic BP dip (%)	abpm.dipsys
Diastolic BP dip (%)	abpm.dipdia
MAP dip (%)	abpm.dipmap
High systolic BP (%)	abpm.limitsys
High diastolic BP (%)	abpm.limitdia
Donor vs. Control	data_results.donor

Table D: Comparison of values computed in integrity check to reference article Table 2 values

Parameter	Donors Manuscript (n=135)	Donors DSIC (n=135)	Diff. (n=0)	Controls Manuscript (n=126)	Controls DSIC (n=126)	Diff. (n=0)
Duration of recording (h)	24.4±11.5	24.4±11.5	0±0	25.1±9.9	25.1±10.0	0±0.1
No. of measurements	43.8±15.4	43.8±15.4	0±0	45.4±16.6	45.4±16.6	0±0
Systolic BP (mm Hg)	120.7±9.7	120.7±9.7	0±0	120.0±11.2	120.0±11.2	0±0
Diastolic BP (mm Hg)	74.5±6.5	74.5±6.5	0±0	73.4±7.0	73.4± 7.0	0±0
MAP (mm Hg)	89.9±6.8	89.9±6.8	0±0	88.7±7.3	88.7±7.3	0±0
Pulse pressure (mm Hg)	46.3±7.3	46.3±7.3	0±0	46.7±8.6	46.7±8.6	0±0
Heart rate (bpm)	73.5±9.1	73.5±9.1	0±0	71.6±8.8	71.6±8.8	0±0
Systolic BP dip (%)	9.2±5.4	9.2±5.4	0±0	8.4±6.3	8.4±6.3	0±0
Diastolic BP dip (%)	13.7±7.3	13.7±7.3	0±0	13.2±7.4	13.2±7.4	0±0
MAP dip (%)	11.3±6.1	11.3±6.1	0±0	11.2±6.6	11.2±6.6	0±0
High systolic BP (%)	18.8±21.9	18.8±21.9	0±0	19.8±24.2	19.7±24.2	0.1±0
High diastolic BP (%)	22.2±19.4	21.2±19.8	1.0±0.4	16.8±19.2	16.8±19.2	0±0

Table E: Variables used to replicate Table 3: Kidney function at 6, 12, 24, and 36 months after kidney donation

Characteristic	**dataset.variable**
mGFR (mL/min)	slope_calculation.ihxrc
mGFR (mL/min/1.73 m²)	slope_calculation.ihxsc
Scr (mg/dL)	data_results.value where lab = “CREATR”
$eGFR_{cr}$ (mL/min/1.73 m²)	data_results.value where lab = “CREATR”, data_crf.age, data_crf.eth, data_crf.sex
CysC (mg/dL)	slope_calculation.cystat
$eGFR_{cys}$ (mL/min/1.73 m²)	slope_calculation.cystat, data_crf.age, data_crf.eth, data_crf.sex
$eGFR_{cr\text{-}cys}$ (mL/min/1.73 m²)	data_results.value where lab = “CREATR”, slope_calculation.cystat, data_crf.age, data_crf.eth, data_crf.sex
Urea nitrogen (mg/dL)	data_results.value where lab = “BUN”
Urine PCR (g/g)	data_results.value where lab = “UTP”, data_results.value where lab = “CRDUR”
Urine ACR (mg/g)	data_results.value where lab = “UMALI”, data_results.value where lab = “CRDUR”
Donor vs. Control	data_results.donor
Visit	data_results.visit

Table F: Comparison of values computed in integrity check to reference article Table 3 values

Test	Group	6 Mo Manuscript	6 Mo DSIC	Diff.	12 Mo Manuscript	12 Mo DSIC	Diff.
mGFR (mL/min)	Controls	104.9±20.2 (194)	104.9±20.2 (194)	0±0 (0)	105.4±20.2 (189)	105.4±20.2 (189)	0±0 (0)
	Donors	74.3±12.9 (193)	74.3±12.9 (193)	0±0 (0)	74.5±13.3 (192)	74.5±13.3 (192)	0±0 (0)
mGFR (mL/min/1.73 m²)	Controls	94.6±15.1 (194)	94.6±15.1 (194)	0±0 (0)	94.8±15.3 (189)	94.8±15.3 (189)	0±0 (0)
	Donors	67.6±10.1 (193)	67.6±10.1 (193)	0±0 (0)	67.5±10.4 (192)	67.5±10.4 (192)	0±0 (0)
Scr (mg/dL)	Controls	0.80±0.17 (198)	0.80±0.17 (200)	0±0 (2)	0.80±0.16 (193)	0.80±0.16 (193)	0±0 (0)
	Donors	1.16±0.22 (199)	1.18±0.31 (200)	0.02±0.09 (1)	1.15±0.22 (196)	1.15±0.22 (196)	0±0 (0)
$eGFR_{cr}$ (mL/min/1.73 m²)	Controls	99.1±16.0 (198)	99.4±16.1 (200)	0.3±0.1 (2)	98.3±16.7 (193)	98.5±16.6 (193)	0.2±0.1 (0)
	Donors	65.5±13.1 (199)	65.2±13.6 (200)	0.3±0.5 (1)	66.5±13.3 (196)	66.4±13.3 (196)	0.1±0 (0)
CysC (mg/dL)	Controls	0.81±0.14 (198)	0.81±0.14 (198)	0±0 (0)	0.81±0.13 (193)	0.81±0.13 (193)	0±0 (0)
	Donors	1.11±0.17 (199)	1.11±0.17 (199)	0±0 (0)	1.08±0.15 (196)	1.08±0.15 (196)	0±0 (0)
$eGFR_{cys}$ (mL/min/1.73 m²)	Controls	102.3±17.5 (198)	102.3±17.5 (198)	0±0 (0)	102.3±15.9 (193)	102.4±15.9 (193)	0.1±0 (0)
	Donors	71.6±15.3 (199)	71.6±15.3 (199)	0±0 (0)	73.6±14.8 (196)	73.6±14.8 (196)	0±0 (0)
$eGFR_{cr\text{-}cys}$ (mL/min/1.73 m²)	Controls	101.3±16.8 (198)	101.5±16.8 (198)	0.2±0 (0)	100.7±15.3 (193)	100.9±15.2 (193)	0.2±0.1 (0)
	Donors	67.4±12.6 (198)	67.1±12.8 (199)	0.3±0.2 (1)	68.8±12.5 (196)	68.8±12.5 (196)	0±0 (0)
Urea nitrogen (mg/dL)	Controls	14.5±4.0 (198)	14.5±4.0 (200)	0±0 (2)	14.5±4.1 (193)	14.5±4.1 (193)	0±0 (0)
	Donors	18.0±4.4 (200)	18.0±4.4 (200)	0±0 (0)	17.5±4.0 (196)	17.5±4.0 (196)	0±0 (0)
Urine PCR (g/g)	Controls	62 [50-128] (195)	64 [48-128] (197)	2 [2-0] (2)	70 [50-106] (193)	69 [49-106] (193)	1 [1-0] (0)
	Donors	70 [50-116] (201)	74 [53-116] (201)	4 [3-0] (0)	70 [50-116] (197)	74 [48-116] (197)	4 [2-0] (0)
Urine ACR (mg/g)	Controls	4.7 [3.4-7.1] (193)	4.7 [3.4-7.1] (195)	0 [0-0] (2)	5.0 [3.5-7.7] (191)	5.0 [3.4-7.7] (191)	0 [0.1-0] (0)
	Donors	3.6 [2.4-5.8] (198)	3.6 [2.4-5.8] (198)	0 [0-0] (0)	3.5 [2.4-6.1] (195)	3.5 [2.4-6.1] (195)	0 [0-0] (0)

Test	Group	24 Mo Manuscript	24 Mo DSIC	Diff.	36 Mo Manuscript	36 Mo DSIC	Diff.
mGFR (mL/min)	Controls	104.5±19.7 (177)	104.2±19.4 (176)	0.3±0.3 (1)	104.1±20.7 (168)	104.1±20.7 (168)	0±0 (0)
	Donors	76.3±13.9 (182)	76.7±15.0 (183)	0.4±1.1 (1)	77.5±14.0 (180)	77.5±14.0 (180)	0±0 (0)
mGFR (mL/min/1.73 m²)	Controls	94.1±14.9 (177)	93.9±14.7 (176)	0.2±0.2 (1)	93.2±14.6 (168)	93.2±14.6 (168)	0±0 (0)
	Donors	69.4±10.5 (182)	69.7±11.3 (183)	0.3±0.8 (1)	69.7±10.1 (180)	69.7±10.0 (180)	0±0.1 (0)
Scr (mg/dL)	Controls	0.80±0.15 (182)	0.80±0.15 (182)	0±0 (0)	0.80±0.14 (173)	0.80±0.14 (173)	0±0 (0)
	Donors	1.12±0.22 (185)	1.12±0.22 (185)	0±0 (0)	1.10±0.23 (182)	1.10±0.23 (182)	0±0 (0)
$eGFR_{cr}$ (mL/min/1.73 m²)	Controls	97.9±15.2 (182)	98.1±15.2 (182)	0.2±0 (0)	97.5±14.6 (173)	97.8±14.6 (173)	0.3±0 (0)
	Donors	68.0±14.3 (185)	68.0±14.3 (185)	0±0 (0)	69.3±14.6 (182)	69.3±14.6 (182)	0±0 (0)
CysC (mg/dL)	Controls	0.80±0.14 (182)	0.80±0.14 (182)	0±0 (0)	0.81±0.13 (173)	0.81±0.13 (173)	0±0 (0)
	Donors	1.07±0.15 (185)	1.07±0.15 (185)	0±0 (0)	1.06±0.16 (182)	1.06±0.16 (182)	0±0 (0)
$eGFR_{cys}$ (mL/min/1.73 m²)	Controls	103.3±17.2 (182)	103.6±17.3 (182)	0.3±0.1 (0)	101.6±16.5 (173)	101.7±16.6 (173)	0.1±0.1 (0)
	Donors	74.5±15.2 (185)	74.5±15.2 (185)	0±0 (0)	75.2±16.3 (182)	75.2±16.2 (182)	0±0.1 (0)
$eGFR_{cr\text{-}cys}$ (mL/min/1.73 m²)	Controls	101.5±16.0 (182)	101.7±16.1 (182)	0.2±0.1 (0)	100.3±15.3 (173)	100.6±15.3 (173)	0.3±0 (0)
	Donors	70.1±13.1 (185)	70.1±13.1 (185)	0±0 (0)	71.2±14.1 (182)	71.2±14.1 (182)	0±0 (0)
Urea nitrogen (mg/dL)	Controls	14.6±4.1 (182)	14.6±4.1 (182)	0±0 (0)	14.5±3.7 (173)	14.5±3.7 (173)	0±0 (0)
	Donors	17.7±4.4 (185)	17.7±4.4 (185)	0±0 (0)	17.7±4.5 (182)	17.7±4.5 (182)	0±0 (0)
Urine PCR (g/g)	Controls	61 [49-100] (178)	63 [47-100] (178)	2 [2-0] (0)	63 [47-122] (169)	65 [46-122] (169)	2 [1-0] (0)
	Donors	60 [46-114] (182)	60 [45-114] (182)	0 [1-0] (0)	60 [48-111] (181)	60 [45-114] (181)	0 [3-3] (0)
Urine ACR (mg/g)	Controls	5.1 [3.6-7.2] (178)	5.1 [3.6-7.2] (178)	0 [0-0] (0)	4.7 [3.4-7.3] (168)	4.6 [3.4-7.3] (168)	0.1 [0-0] (0)
	Donors	3.8 [2.8-6.6] (182)	3.8 [2.8-6.6] (182)	0 [0-0] (0)	4.2 [2.7-7.1] (180)	4.2 [2.7-7.1] (180)	0 [0-0] (0)

Table G: Variables used to replicate Table 4: Changes in kidney function over time

Characteristic	**dataset.variable**
mGFR (mL/min)	slope_calculation.ihxrc
mGFR (mL/min/1.73 m²)	slope_calculation.ihxsc
$eGFR_{cr}$ (mL/min/1.73 m²)	data_results.value where lab = "CREATR", data_crf.age, data_crf.eth, data_crf.sex
$eGFR_{cys}$ (mL/min/1.73 m²)	slope_calculation.cystat, data_crf.age, data_crf.eth, data_crf.sex
$eGFR_{cr\text{-}cys}$ (mL/min/1.73 m²)	data_results.value where lab = "CREATR", slope_calculation.cystat, data_crf.age, data_crf.eth, data_crf.sex
Donor vs. Control	data_results.donor
Visit	data_results.visit

Table H: Comparison of values computed in integrity check to reference article Table 4 values

Measurement	Follow-up Duration (mo)	Group	Rate of Change in Kidney Function Manuscript	Rate of Change in Kidney Function DSIC	Diff.
mGFR (mL/min per y)	12-36	Controls	-0.36±7.55 (194)	-0.36±7.55 (194)	0±0 (0)
		Donors	1.47±5.02 (198)	1.47±5.02 (198)	0±0 (0)
	36	Controls	-0.19±5.31 (172)	-0.19±5.31 (172)	0±0 (0)
		Donors	1.30±3.49 (181)	1.30±3.49 (181)	0±0 (0)
mGFR (mL/min/1.73 m² per y)	12-36	Controls	-0.44±7.35 (194)	-0.36±7.55 (194)	0.08±0.2 (0)
		Donors	1.09±4.28 (198)	1.47±5.02 (198)	0.38±0.74 (0)
	36	Controls	-0.39±4.81 (172)	-0.19±5.31 (172)	0.2±0.5 (0)
		Donors	0.84±3.09 (181)	1.30±3.49 (181)	0.46±0.4 (0)
$eGFR_{cr}$ (mL/min/1.73 m² per y)	12-36	Controls	-1.04±6.16 (196)	-1.04±6.14 (196)	0±0.02 (0)
		Donors	1.82±4.92 (200)	1.90±5.04 (200)	0.08±0.12 (0)
	36	Controls	-0.46±3.68 (173)	-0.48±3.69 (173)	0.02±0.01 (0)
		Donors	1.60±3.75 (182)	1.68±3.91 (182)	0.08±0.16 (0)
$eGFR_{cys}$ (mL/min/1.73 m² per y)	12-36	Controls	-0.33±7.36 (196)	-0.30±7.37 (196)	0.03±0.01 (0)
		Donors	1.82±6.76 (200)	1.83±6.78 (200)	0.01±0.02 (0)
	36	Controls	0.16±4.68 (173)	0.19±4.71 (173)	0.03±0.03 (0)
		Donors	1.21±5.06 (182)	1.22±5.06 (182)	0.01±0 (0)
$eGFR_{cr\text{-}cys}$ (mL/min/1.73 m² per y)	12-36	Controls	-0.73±6.38 (196)	-0.69±6.37 (196)	0.04±0.01 (0)
		Donors	1.89±4.58 (200)	1.94±4.63 (200)	0.05±0.05 (0)
	36	Controls	-0.07±3.85 (173)	-0.05±3.89 (173)	0.02±0.04 (0)
		Donors	1.49±3.81 (182)	1.54±3.87 (182)	0.05±0.06 (0)

Table I: Variables used to replicate Table 5: Lack of association of age with changes in kidney function in donors and controls

Characteristic	**dataset.variable**
mGFR (mL/min)	slope_calculation.ihxrc
Age	data_crf.age
Donor vs. Control	data_results.donor
Visit	data_results.visit

Table J: Comparison of values computed in integrity check to reference article Table 5 values

Measurement	Age (y)	Group	Rate of Change in Kidney Function Manuscript	Rate of Change in Kidney Function DSIC	Diff.
mGFR (mL/min per y)	< 45	Controls	0.08±9.46 (91)	0.06±9.41 (92)	0.02±0.05 (1)
		Donors	1.02±5.31 (89)	1.02±5.28 (90)	0±0.03 (1)
	≥ 45	Controls	-0.75±5.34 (103)	-0.74±5.37 (102)	0.01±0.03 (1)
		Donors	1.83±4.77 (109)	1.84±4.79 (108)	0.01±0.02 (1)

Table K: Variables used to replicate Table 6: Laboratory measurements at 6, 12, 24, and 36 months after kidney donation

Characteristic	**dataset.variable**
Donor vs. Control	data_results.donor
Visit	data_results.visit, data_crf.visit
Hemoglobin (g/dL)	data_crf.hgb
Leukocyte count (/uL)	data_crf.wbc
Serum albumin (mg/dL)	data_results.value where lab = “ALB”
CRP (mg/dL)	data_results.value where lab = “CRPHS2”
Fibrinogen (mg/dL)	data_results.value where lab = “FIBR”
Homocysteine (mg/L)	data_results.value where lab = “HCY”
Uric acid (mg/dL)	data_results.value where lab = “URIC”
Serum potassium (mmol/L)	data_results.value where lab = “K”
Serum calcium (mg/dL)	data_results.value where lab = “CA”
Serum phosphorus (mg/dL)	data_results.value where lab = “PHOS”
PTH (pg/mL)	data_results.value where lab = “PTHI”
Cholesterol (mg/dL)	data_results.value where lab = “CHR”
LDL choleterol (mg/dL)	data_results.value where lab = “LDLR”
HDL cholesterol (mg/dL)	data_results.value where lab = “HDLR”
Triglycerides (mg/dL)	data_results.value where lab = “TRA”
Lipoprotein(a) (mg/dL)	data_results.value where lab = “LPA”
Hemoglobin A1c (%)	data_results.value where lab = “GLYHB”
Glucose (mg/dL)	data_results.value where lab = “GLUR”
Insulin (pmol/L)	data_results.value where lab = “INS”, data_results.value where lab = “INSR”
HOMA-IR	data_results.value where lab = “GLUR”, data_results.value where lab = “INS”, data_results.value where lab = “INSR”

Table L: Comparison of values computed in integrity check to reference article Table 6 values

Test	Group	6 Mo Manuscript	6 Mo DSIC	Diff.	12 Mo Manuscript	12 Mo DSIC	Diff.
Hemoglobin (g/dL)	Controls	13.6±1.4 (195)	13.6±1.4 (197)	0±0 (2)	13.4±1.4 (191)	13.4±1.4 (191)	0±0 (0)
	Donors	13.2±1.2 (200)	13.2±1.2 (200)	0±0 (0)	13.1±1.3 (197)	13.1±1.3 (196)	0±0 (1)
Leukocyte count (/uL)	Controls	6.0±1.7 (195)	6.0±1.7 (197)	0±0 (2)	6.1±1.8 (190)	6.1±1.8 (190)	0±0 (0)
	Donors	5.8±1.5 (200)	5.8±1.5 (200)	0±0 (0)	5.9±1.8 (196)	5.9±1.7 (195)	0±0.1 (1)
Serum albumin (mg/dL)	Controls	4.07±0.33 (198)	4.08±0.33 (200)	0.01±0 (2)	4.03±0.30 (193)	4.03±0.30 (193)	0±0 (0)
	Donors	4.06±0.31 (200)	4.06±0.31 (200)	0±0 (0)	4.03±0.30 (198)	4.03±0.29 (196)	0±0.01 (2)
CRP (mg/dL)	Controls	1.4 [0.6-3.1] (198)	1.3 [0.6-3.0] (200)	0.1 [0-0.1] (2)	1.2[0.5-2.8] (193)	1.2 [0.5-2.8] (193)	0 [0-0] (0)
	Donors	1.2 [0.7-2.9] (200)	1.2 [0.7-2.9] (200)	0 [0-0] (0)	1.3[0.6-2.5] (196)	1.3 [0.6-2.5] (196)	0 [0-0] (0)
Fibrinogen (mg/dL)	Controls	305±67 (198)	303±69 (200)	2±2 (2)	306±74 (193)	306±74 (193)	0±0 (0)
	Donors	300±72 (198)	300±72 (198)	0±0 (0)	310±66 (196)	310±66 (196)	0±0 (0)
Homocysteine (mg/L)	Controls	1.21±0.34 (196)	1.21±0.34 (198)	0±0 (2)	1.21±0.37 (193)	1.21±0.37 (193)	0±0 (0)
	Donors	1.49±0.43 (198)	1.49±0.43 (198)	0±0 (0)	1.46±0.42 (196)	1.46±0.42 (196)	0±0 (0)
Uric acid (mg/dL)	Controls	4.9±1.2 (198)	4.9±1.2 (200)	0±0 (2)	4.9±1.2 (193)	4.9±1.2 (193)	0±0 (0)
	Donors	5.3±1.1 (200)	5.3±1.1 (200)	0±0 (0)	5.2±1.2 (196)	5.2±1.2 (196)	0±0 (0)
Serum potassium (mmol/L)	Controls	4.14±0.32 (197)	4.14±0.32 (199)	0±0 (2)	4.10±0.29 (187)	4.12±0.37 (188)	0.02±0.08 (1)
	Donors	4.20±0.29 (199)	4.20±0.29 (199)	0±0 (0)	4.19±0.35 (193)	4.19±0.35 (193)	0±0 (0)
Serum calcium (mg/dL)	Controls	9.19±0.38 (198)	9.19±0.38 (200)	0±0 (2)	9.18±0.42 (193)	9.18±0.42 (193)	0±0 (0)
	Donors	9.24±0.42 (200)	9.24±0.42 (200)	0±0 (0)	9.18±0.41 (196)	9.18±0.41 (196)	0±0 (0)
Serum phosphorus (mg/dL)	Controls	3.49±0.48 (198)	3.49±0.48 (200)	0±0 (2)	3.55±0.46 (190)	3.55±0.46 (190)	0±0 (0)
	Donors	3.30±0.48 (200)	3.30±0.48 (200)	0±0 (0)	3.37±0.51 (195)	3.37±0.51 (195)	0±0 (0)
PTH (pg/mL)	Controls	42.8±15.6 (198)	42.9±15.5 (200)	0.1±0.1 (2)	42.4±16.7 (193)	42.4±16.7 (193)	0±0 (0)

Test	Group	6 Mo Manuscript	6 Mo DSIC	Diff.	12 Mo Manuscript	12 Mo DSIC	Diff.
	Donors	52.7±20.9 (200)	52.7±20.9 (200)	0±0 (0)	52.9±22.1 (196)	52.9±22.1 (196)	0±0 (0)
Cholesterol (mg/dL)	Controls	186±36 (197)	186±36 (199)	0±0 (2)	185±37 (193)	185±37 (193)	0±0 (0)
	Donors	186±35 (199)	186±35 (199)	0±0 (0)	184±32 (195)	184±32 (195)	0±0 (0)
LDL choleterol (mg/dL)	Controls	111±30 (193)	111±30 (195)	0±0 (2)	111±30 (190)	111±30 (190)	0±0 (0)
	Donors	110±31 (193)	110±31 (193)	0±0 (0)	108±30 (194)	108±30 (194)	0±0 (0)
HDL cholesterol (mg/dL)	Controls	54.9±16.4 (195)	55.0±16.4 (197)	0.1±0 (2)	54.5±15.9 (193)	54.5±15.9 (193)	0±0 (0)
	Donors	54.1±13.9 (197)	54.1±13.9 (197)	0±0 (0)	55.1±14.2 (195)	55.1±14.2 (195)	0±0 (0)
Triglycerides (mg/dL)	Controls	80 [59-119] (197)	80 [59-120] (199)	0 [0-1] (2)	77 [62-117] (193)	77 [62-117] (193)	0 [0-0] (0)
	Donors	84 [64-124] (199)	84 [64-124] (199)	0 [0-0] (0)	81 [61-122] (195)	81 [61-122] (195)	0 [0-0] (0)
Lipoprotein(a) (mg/dL)	Controls	16.0 [5.0-43.0] (198)	16.0 [5.0-43.5] (200)	0 [0-0.5] (2)	15.0 [5.0-44.0] (193)	15.0 [5.0-44.0] (193)	0 [0-0] (0)
	Donors	20.0 [5.0-54.5] (200)	20.0 [5.0-54.5] (200)	0 [0-0] (0)	18.0 [5.0-51.5] (196)	18.0 [5.0-51.5] (196)	0 [0-0] (0)
Hemoglobin A1c (%)	Controls	5.3±0.35 (195)	5.3±0.35 (197)	0±0 (2)	5.3±0.34 (190)	5.3±0.34 (192)	0±0 (2)
	Donors	5.3±0.31 (197)	5.3±0.31 (197)	0±0 (0)	5.3±0.38 (191)	5.3±0.38 (194)	0±0 (3)
Glucose (mg/dL)	Controls	91.2±8.94 (197)	91.2±8.90 (199)	0±0.4 (2)	91.1±8.66 (193)	91.1±8.66 (193)	0±0 (0)
	Donors	89.2±8.51 (199)	89.2±8.51 (199)	0±0 (0)	90.7±11.4 (195)	90.7±11.4 (195)	0±0 (0)
Insulin (pmol/L)	Controls	39 [26-64] (192)	39 [26-62] (194)	0 [0-2] (2)	36 [24-54] (188)	36 [24-55] (188)	0 [0-1] (0)
	Donors	36 [24-54] (198)	36 [24-54] (198)	0 [0-0] (0)	41 [24-66] (194)	41 [24-66] (194)	0 [0-0] (0)
HOMA-IR	Controls	1.5 [0.96-2.5] (191)	1.4 [0.97-2.4] (193)	0.1 [0.01-0.1] (2)	1.4 [0.88-2.2] (188)	1.4 [0.88-2.2] (188)	0 [0-0] (0)
	Donors	1.4 [0.91-2.1] (197)	1.3 [0.91-2.1] (197)	0.1 [0-0] (0)	1.4 [0.95-2.5] (193)	1.4 [0.95-2.5] (193)	0 [0-0] (0)

Test	Group	24 Mo Manuscript	24 Mo DSIC	Diff.	36 Mo Manuscript	36 Mo DSIC	Diff.
Hemoglobin (g/dL)	Controls	13.6±1.2 (175)	13.6±1.2 (175)	0±0 (0)	13.6±1.2 (173)	13.6±1.2 (173)	0±0 (0)
	Donors	13.4±1.3 (183)	13.4±1.3 (183)	0±0 (0)	13.5±1.4 (172)	13.5±1.4 (172)	0±0 (0)
Leukocyte count (/uL)	Controls	6.0±1.6 (174)	5.9±1.6 (174)	0.1±0 (0)	6.0±1.8 (157)	6.0±1.8 (157)	0±0 (0)
	Donors	5.7±1.5 (182)	5.7±1.5 (182)	0±0 (0)	5.8±1.6 (169)	5.8±1.6 (169)	0±0 (0)
Serum albumin (mg/dL)	Controls	4.06±0.32 (182)	4.06±0.32 (182)	0±0 (0)	4.02±0.27 (173)	4.02±0.27 (173)	0±0 (0)
	Donors	4.05±0.30 (185)	4.05±0.30 (185)	0±0 (0)	4.00±0.27 (182)	4.00±0.27 (182)	0±0 (0)
CRP (mg/dL)	Controls	1.2 [0.5-2.6] (182)	1.2 [0.5-2.6] (182)	0 [0-0] (0)	1.0 [0.6-2.4] (173)	1.0 [0.6-2.4] (173)	0 [0-0] (0)
	Donors	1.1 [0.6-2.5] (185)	1.1 [0.6-2.5] (185)	0 [0-0] (0)	1.2 [0.6-3.0] (182)	1.2 [0.6-3.0] (182)	0 [0-0] (0)
Fibrinogen (mg/dL)	Controls	311±65 (182)	311±65 (182)	0±0 (0)	306±67 (173)	306±67 (173)	0±0 (0)
	Donors	309±81 (185)	309±81 (185)	0±0 (0)	309±70 (181)	309±70 (181)	0±0 (0)
Homocysteine (mg/L)	Controls	1.28±0.43 (182)	1.28±0.43 (182)	0±0 (0)	1.23±0.38 (173)	1.23±0.38 (173)	0±0 (0)
	Donors	1.50±0.42 (185)	1.50±0.42 (185)	0±0 (0)	1.41±0.43 (182)	1.41±0.43 (182)	0±0 (0)
Uric acid (mg/dL)	Controls	4.9±1.2 (182)	4.9±1.2 (182)	0±0 (0)	5.0±1.1 (173)	5.0±1.1 (173)	0±0 (0)
	Donors	5.4±1.2 (185)	5.4±1.2 (185)	0±0 (0)	5.5±1.3 (182)	5.5±1.3 (182)	0±0 (0)
Serum potassium (mmol/L)	Controls	4.12±0.31 (177)	4.12±0.31 (177)	0±0 (0)	4.11±0.28 (172)	4.11±0.28 (172)	0±0 (0)
	Donors	4.20±0.32 (181)	4.20±0.32 (181)	0±0 (0)	4.17±0.27 (178)	4.17±0.27 (178)	0±0 (0)
Serum calcium (mg/dL)	Controls	9.17±0.41 (182)	9.17±0.41 (182)	0±0 (0)	9.21±0.40 (173)	9.21±0.40 (173)	0±0 (0)
	Donors	9.24±0.38 (185)	9.24±0.38 (185)	0±0 (0)	9.26±0.40 (182)	9.26±0.40 (182)	0±0 (0)
Serum phosphorus (mg/dL)	Controls	3.52±0.46 (178)	3.52±0.46 (178)	0±0 (0)	3.51±0.46 (172)	3.51±0.46 (172)	0±0 (0)
	Donors	3.43±0.51 (182)	3.43±0.51 (182)	0±0 (0)	3.42±0.51 (178)	3.42±0.51 (178)	0±0 (0)
PTH (pg/mL)	Controls	43.6±16.3 (182)	43.6±16.3 (182)	0±0 (0)	43.2±17.5 (173)	43.2±17.5 (173)	0±0 (0)
	Donors	51.7±20.6 (185)	51.7±20.6 (185)	0±0 (0)	52.5±24.1 (182)	52.5±24.1 (182)	0±0 (0)

Test	Group	24 Mo Manuscript	24 Mo DSIC	Diff.	36 Mo Manuscript	36 Mo DSIC	Diff.
Cholesterol (mg/dL)	Controls	188±34 (182)	188±34 (182)	0±0 (0)	190±35 (173)	190±35 (173)	0±0 (0)
	Donors	186±36 (185)	186±36 (185)	0±0 (0)	188±35 (182)	188±34 (182)	0±1 (0)
LDL choleterol (mg/dL)	Controls	113±29 (182)	113±29 (182)	0±0 (0)	115±30 (172)	115±30 (172)	0±0 (0)
	Donors	109±30 (184)	109±30 (184)	0±0 (0)	111±31 (180)	111±31 (180)	0±0 (0)
HDL cholesterol (mg/dL)	Controls	56.8±16.2 (182)	56.8±16.1 (182)	0±0.1 (0)	56.2±16.0 (172)	56.2±16.0 (173)	0±0 (1)
	Donors	56.6±15.8 (185)	56.5±15.8 (185)	0.1±0 (0)	56.5±15.0 (181)	56.5±15.0 (182)	0±0 (1)
Triglycerides (mg/dL)	Controls	78 [59-104] (182)	78 [59-104] (182)	0 [0-0] (0)	76 [59-107] (173)	76 [59-107] (173)	0 [0-0] (0)
	Donors	84 [65-127] (185)	84 [65-127] (185)	0 [0-0] (0)	89 (61-124] (182)	90 [61-124] (182)	1 [0-0] (0)
Lipoprotein(a) (mg/dL)	Controls	15.0 [5.0-42.0] (182)	15.0 [5.0-42.0] (182)	0 [0-0] (0)	15.0 [5.0-45.0] (173)	15.0 [5.0-45.0] (173)	0 [0-0] (0)
	Donors	20.0 [11.0-49.0] (185)	20.0 [11.0-49.0] (185)	0 [0-0] (0)	18.5 [10.0-45.0] (182)	18.5 [10.0-45.0] (182)	0 [0-0] (0)
Hemoglobin A1c (%)	Controls	5.4±0.34 (181)	5.4±0.34 (181)	0±0 (0)	5.4±0.33 (173)	5.4±0.33 (173)	0±0 (0)
	Donors	5.3±0.32 (181)	5.3±0.32 (182)	0±0 (1)	5.3±0.33 (181)	5.3±0.33 (181)	0±0 (0)
Glucose (mg/dL)	Controls	92.5±9.23 (182)	92.5±9.23 (182)	0±0 (0)	93.2±9.03 (173)	93.2±9.03 (173)	0±0 (0)
	Donors	90.6±8.72 (185)	90.6±8.72 (185)	0±0 (0)	91.4±8.78 (182)	91.4±8.78 (182)	0±0 (0)
Insulin (pmol/L)	Controls	39 [25-65] (174)	39 [25-65] (174)	0 [0-0] (0)	42 [29-64] (166)	42 [29-64] (166)	0 [0-0] (0)
	Donors	43 [30-63] (183)	43 [30-63] (183)	0 [0-0] (0)	43 [31-66] (171)	43 [31-66] (171)	0 [0-0] (0)
HOMA-IR	Controls	1.5 [0.94-2.5] (174)	1.5 [0.94-2.5] (174)	0 [0-0] (0)	1.6 [1.1-2.6] (166)	1.6 [1.1-2.6] (166)	0 [0-0] (0)
	Donors	1.7 [1.0-2.3] (183)	1.7 [1.0-2.3] (183)	0 [0-0] (0)	1.6 [1.1-2.7] (171)	1.6 [1.1-2.7] (171)	0 [0-0] (0)

Attachment A: SAS Code

```
/*************************************************************************************************************************
  Project:     ALTOLD
  Name:        /prj/niddk/ims_analysis/ALTOLD/prog_initial_analysis
  Description: This program reads in the data received for the ALTOLD project, creates frequency distributions, and
                                          recreates tables from the publication in the American Journal of Kidney Disease
published in July, 2015.
  Programmer:  Jen Boyd-Morin
  Updated by Allyson Mateja 4/4/17
  Date:        December 30, 2016
  SAS Datasets:        ALTOLD Lab Data First 3 Years.xlsx -> lab_data
                                                 ALTOLD Data First 3 Years.xlsx:
                                                 Sheet='Lab Results' -> data_results
                                                 Sheet='CRF Data' -> data_crf
  Updates:             February 20, 2017:
                                          -An Excel spreadsheet containing the 24h ABPM from the 36 month visits
                                          -The following responses was provided regarding the selection of the cohort:
                                          "2)    Our definition of “enrolled” was if they completed at least one post-donation
follow-up visit. Those who
                                          did a pre-donation follow-up visit, but no post-donation visit, were not considered to
be in the cohort. As
                                          described in our first report (Am J Kidney Dis 2013;62:577), there were 201 controls and
203 donors enrolled."
*************************************************************************************************************************/

proc format;
       value agef 1 = '< 45'
                  2 = '>= 45';

libname sasfile '/prj/niddk/ims_analysis/ALTOLD/private_created_data';
libname out '/prj/niddk/ims_analysis/ALTOLD/private_created_data/sas_data/';

/* Read in datasets & print frequency distributions */
**Lab results dataset;
data lab_data;
       set sasfile.lab_data;

proc contents data=lab_data;
       title3 'Contents of ALTOLD Lab Data First 3 Years.xls';

proc sort data=lab_data;
       by id visit lab;

**Lab results from main spreadsheet;
data data_results;
       set sasfile.data_results;
```

```
proc contents data=data_results;
       title3 'Contents of ALTOLD Data First 3 Years.xls, Sheet=Lab Results (10-01-15)';

proc print data=data_results (obs=10);

proc import datafile = '/prj/niddk/ims_analysis/ALTOLD/private_orig_data/Data/ABPM (7-24-2014).xlsx'
       dbms = xlsx
       out = abpm_data;
       sheet = 'Sheet1';
       getnames = yes;
run;

data out.abpm;
       set abpm_data;

proc import datafile = '/prj/niddk/ims_analysis/ALTOLD/private_orig_data/Data/Slope Calculations at 3 Years.xlsx'
       dbms = xlsx
       out = slope_data;
       sheet = 'SlopeCalculation';
       getnames = yes;
run;

data out.slope_calculation;
       set slope_data;

proc contents data = abpm_data;

/* Compare data in lab results file to lab results in CRF file */
/* Data is the same - do not need lab data file */
data data_results;
  set data_results;
  rename value=crf_value;

proc sort data=data_results;
       by id visit lab;

data comp_lab labonly crfonly;
       merge lab_data (in=inlab)
                              data_results (in=indata);
                              ;
       by id visit lab;
       if inlab and not indata then output labonly;
       if not inlab and indata then output crfonly;
       if inlab and indata then do;
                if value ne crf_value then diff_flag=1;
                else diff_flag=0;
                output comp_lab;
  end;
```

```
proc freq data=comp_lab;
       tables visit*diff_flag/missing list;

**Collapse lab results from main spreadsheet to one record per visit;
**Keep relevant lab values for reproducing Table 6;
**Will need to add additional values needed for calculating GFR, etc. for Tables 4/5 (ie. Iohexal) once formulas obtained;
**Units need to be converted for some variables;
data labs_oneper;
       set data_results;
       by id visit;
       retain ALB
                              CRPHS2
                              FIBR
                              HCY
                              URIC
                              K
                              CA
                              PHOS
                              PTHI
                              CHR
                              LDLR
                              HDLR
                              TRR
                              LPA
                              GLYHB
                              GLUR
                              INS
                              CYSC
                              BUN
                              CREATR
                              IHXRC
                              IHXSC
                              SLINVCYS
                              CYSC_DATE
                              UTP
                              UMALI
                              CRDUR
                              DATE;


       if first.visit then do;
                ALB           =.;
                CRPHS2 =.;
                FIBR          =.;
                HCY           =.;
                URIC          =.;
                K                     =.;
                CA                    =.;
                PHOS          =.;
```

```
        PTHI          =.;
        CHR           =.;
        LDLR          =.;
        HDLR          =.;
        TRR           =.;
        LPA           =.;
        GLYHB  =.;
        GLUR          =.;
        INS      =.;
        CYSC   =.;
        BUN    =.;
        CREATR =.;
        IHXRC  =.;
        IHXSC  =.;
        SLINVCYS =.;
        CYSC_DATE =.;
        UTP =.;
        UMALI =.;
        CRDUR =.;
        DATE=.;
end;

if lab="ALB" then ALB=crf_value;
else if lab="CRPHS2" then CRPHS2=crf_value;
else if lab="FIBR" then FIBR=crf_value;
else if lab="HCY" then HCY=crf_value;
else if lab="URIC" then URIC=crf_value;
else if lab="K" then K=crf_value;
else if lab="CA" then CA=crf_value;
else if lab="PHOS" then PHOS=crf_value;
else if lab="PTHI" then PTHI=crf_value;
else if lab="CHR" then CHR=crf_value;
else if lab="LDLR" then LDLR=crf_value;
else if lab="HDLR" then HDLR=crf_value;
else if lab="TRR" then TRR=crf_value;
else if lab="LPA" then LPA=crf_value;
else if lab="GLYHB" then GLYHB=crf_value;
else if lab="GLUR" then GLUR=crf_value;
else if lab = "INS" then INS=crf_value*6;
else if lab = "INSR" then INS=crf_value;
else if lab = "CYSC" then do;
       CYSC=crf_value;
       CYSC_DATE=ldate;
end;
else if lab = "BUN" then BUN=crf_value;
else if lab = "CREATR" then CREATR=crf_value;
else if lab = "IHXRC" then IHXRC=crf_value;
else if lab = "IHXSC" then IHXSC=crf_value;
else if lab = "SLINVCYS" then SLINVCYS=crf_value;
```

```
        else if lab = "UTP" then UTP = crf_value;
        else if lab = "CRDUR" then CRDUR = crf_value;
        else if lab = "UMALI" then UMALI = crf_value;
        DATE = ldate;
        if last.visit then output;

data labs_oneper;
        set labs_oneper;

        **Unit conversions using footnote from table 6;
        hcy=hcy*(1/7.397);
        glur_conv = glur*0.05551;
        ins_conv = ins*(1/6);
        **Calculate HOMA-IR;
        if ins ne . & glur ne . then homa_ir=((ins_conv*glur_conv)/22.5);
        else homa_ir=.;
        cysc = cysc*(1/0.87);
        urine_pcr = (round(utp*100000,1)/crdur);
        urine_acr = (umali/crdur)*100;
        **Label variables;
        label GLYHB      ='Serum glycated hemoglobin %'
                              ALB                    ='Serum albumin g/L'
                              CRPHS2  ='Highly sensitive CRP 2'
                              FIBR           ='Serum fibrinogen mg/dL'
                              HCY                    ='Serum homocysteine umol/L'
                              URIC           ='Serum uric acid mg/dL'
                              K                              ='Serum potassium mmol/L'
                              CA                     ='Serum calcium mg/dL'
                              PHOS           ='Serum phosphorous mg/dL'
                              PTHI           ='Serum parathyroid hormone (U of MN lab) pg/mL'
                              CHR                    ='Serum cholesterol mg/dL'
                              LDLR           ='Low density lipoprotein cholesterol mg/dL'
                              HDLR           ='High density lipoprotein cholesterol mg/dL'
                              TRR                    ='Serum triglycerides mg/dL'
                              LPA                    ='Lipoprotein (a) mg/dL'
                              GLUR           ='Serum glucose mg/dL'
                              INS                    ='Serum insulin pmol/L'
                              fibr    ='Serum fibrinogen umol/L'
                              hcy     ='Serum homocysteine umol/L'
                              uric='Serum uric acid umol/L'
                              ca='Serum calcium mmol/L'
                              phos    ='Serum phosphorous mmol/L'
                              chr     ='Serum cholesterol mmol/L'
                              trr     ='Serum triglycerides mmol/L'
                              glur    ='Serum glucose mmol/L'
                              ins     ='Serum insulin uIU/mL'
                              ins_new = 'Serum insulin'
                              homa_ir ='Homeostatic Model Assessment of Insulin Resistance'
                              ;
```

```
**CRF data from main spreadsheet;
data data_crf;
       set sasfile.data_crf;
       **Select only subjects with at least one follow-up visit;
/*     if visit in (6,12,24,36);*/

       **Create variables identifying donors and controls;
  if substr(id,2,1)='S' then casectl=0;
  else if substr(id,2,1)='D' then casectl=1;
  else casectl=.e;

  **Label variables using CRF key from Excel spreadsheet;
  **Some variables need to be supplemented with information from the study documentation;
  label Beer   ='Beer'
                              Both   ='Both wine and beer     '

                              Oth            ='Other                  '
                              Preg   ='Number of pregnancies  '
                              Deliv  ='Number of deliveries   '
                              WtKg   ='Weight in kiograms     '
                              HtCm   ='Height in centimeters  '
                              WstCm  ='Waist circumference    '
                              Sys1   ='Systolic BP 1st reading mm Hg  '
                              Dia1   ='Diastolic BP 1st reading mm Hg '
                              P1             ='Heart rate 1st reading         '
                              Sys2   ='Systolic BP 2nd reading mm Hg  '
                              Dia2   ='Diastolic BP 2nd reading mm Hg '
                              P2             ='Heart rate 2nd reading         '
                              Sys3   ='Systolic BP 3rd reading mm Hg  '
                              Dia3   ='Diastolic BP 3rd reading mm Hg '
                              P3             ='Heart rate 3rd reading         '
                              HIPCM  ='Hip circumference in centimeters'
                              WBC            ='Local lab white blood count'
                              Hgb            ='Local lab hemoglobin       '
                              SG             ='Urinalysis dip stick specific gravity'
                              Ph             ='Urinalysis dip stick Ph'
                              PRO            ='Urinalysis dip stick protein'
                              GLU            ='Urinalysis dip stick glucose'
                              BILI   ='Urinalysis dip stick bilirubin'
                              BLD            ='Urinalysis dip stick blood'
                              KET            ='Urinalysis dip stick ketones'
                              NIT            ='Urinalysis dip stick nitrates'
                              LE             ='Urinalysis dip stick leukocyte esterase'
                              ;

proc contents data=data_crf;
       title3 'Contents of ALTOLD Data First 3 Years.xls, Sheet=CRF Data';
```

```
/* Confirm correct number of donors and controls in dataset */
/* Note: We have 2 additional controls; complete analysis with these numbers */
proc sort data=data_crf;
	by id visit;

data crf_collapse;
	set data_crf;
	by id visit;
	retain visit_0 visit_6 visit_12 visit_24 visit_36 visit0_date visit6_date visit12_date visit24_date visit36_date;
	if first.id then do;
		 visit_0=.;
		 visit_6=.;
		 visit_12=.;
		 visit_24=.;
		 visit_36=.;
		 visit0_date=.;
		 visit6_date=.;
		 visit12_date=.;
		 visit24_date=.;
		 visit36_date=.;
	end;
	if visit=0 then do;
		visit_0=1;
		visit0_date = vdate;
	end;
	else if visit=6 then do;
		visit_6=1;
		visit6_date = vdate;
	end;
	else if visit=12 then do;
		visit_12=1;
		visit12_date = vdate;
	end;
	else if visit=24 then do;
		visit_24=1;
		visit24_date = vdate;
	end;
	else if visit=36 then do;
		visit_36=1;
		visit36_date = vdate;
	end;
	if last.id then output;

data crf_collapse;
	set crf_collapse;
	**Identify subjects who had a post-donation follow-up visit;
	if visit_6=1 or visit_12=1 or visit_24=1 or visit_36=1 then had_post=1;
	else had_post=0;
```

```
proc freq data=crf_collapse;
       tables had_post*casectl casectl*visit_6*visit_12*visit_24*visit_36 /missing list;
       where had_post=1;

       title3 'Identify number of donors & controls in our dataset';

proc freq data = crf_collapse;
       tables casectl*visit12_date*visit24_date*visit36_date /list missing;
       format visit12_date visit24_date visit36_date mmddyy10.;
       where (visit_24 = . or visit_36 = .) and had_post=1;

data selected_subjects;
       set crf_collapse;
       if visit_6 = 1 and visit_12 = . and visit_24 = 1 and visit_36 = . then exclude = 1;
       else exclude = 0;
       if had_post = 1 and exclude = 0;

proc freq data = selected_subjects;
       tables casectl;
       title3 'Donors and Controls selected';

/* Combine files */
proc sort data=data_crf;
       by id visit;

proc sort data = slope_data;
       by id visit;

data final;
       merge data_crf (in=incrf)
                              labs_oneper (in=inlabs)
                              slope_data (keep=id visit creatr cystat ihxrc ihxsc rename = (creatr=slope_creatr ihxrc=slope_ihxrc
ihxsc=slope_ihxsc));
       by id visit;
       if incrf & inlabs then pop=1;
       else if incrf & not inlabs then pop=2;
       else if not incrf & inlabs then pop=3;


proc freq data=final;
       tables pop/missing list;
run;

data table1;
       merge final        (in=val1)
             crf_collapse (in=val2 keep=id casectl);
       by id;
       heart_rate_avg = (p1+p2+p3)/3;
       sbp_avg = (sys1+sys2+sys3)/3;
```

```
	dbp_avg = (dia1+dia2+dia3)/3;
	pp1 = sys1-dia1;
	pp2 = sys2-dia2;
	pp3 = sys3-dia3;
	pp_avg = (pp1+pp2+pp3)/3;
	hgb_new=input(hgb, 4.);
	wbc_new=input(wbc, 8.);
	if hgb_new = 0 then hgb_new = .;
	if wbc_new = 0 then wbc_new = .;
	if eth = 'B' then do;
		if sex = 'F' then do;
			if      . < creatr <= 0.7 then do;
				egfr_cr = 166 * ((creatr/0.7)**(-0.329)) * (0.993**Age);
				if . < cystat <= 0.8 then egfr_cys_cr = 140.4* ((creatr/0.7)**(-0.248)) * ((cystat/0.8)**(-0.375)) *
(0.995**Age);
				else if cystat > 0.8 then egfr_cys_cr = 140.4* ((creatr/0.7)**(-0.248)) * ((cystat/0.8)**(-0.711)) *
(0.995**Age);
			end;
			else if creatr > 0.7  then do;
				egfr_cr = 166 * ((creatr/0.7)**(-1.209)) * (0.993**Age);
				if . < cystat <= 0.8 then egfr_cys_cr = 140.4* ((creatr/0.7)**(-0.601)) * ((cystat/0.8)**(-0.375)) *
(0.995**Age);
				else if cystat > 0.8 then egfr_cys_cr = 140.4* ((creatr/0.7)**(-0.601)) * ((cystat/0.8)**(-0.711)) *
(0.995**Age);
			end;
		end;
		else do;
			if      . < creatr <= 0.9 then do;
				egfr_cr = 163 * ((creatr/0.9)**(-0.411)) * (0.993**Age);
				if . < cystat <= 0.8 then egfr_cys_cr = 146* ((creatr/0.9)**(-0.207)) * ((cystat/0.8)**(-0.375)) *
(0.995**Age);
				else if cystat > 0.8 then egfr_cys_cr = 146* ((creatr/0.9)**(-0.207)) * ((cystat/0.8)**(-0.711)) *
(0.995**Age);
			end;
			else if creatr > 0.9  then do;
				egfr_cr = 163 * ((creatr/0.9)**(-1.209)) * (0.993**Age);
				if . < cystat <= 0.8 then egfr_cys_cr = 146* ((creatr/0.9)**(-0.601)) * ((cystat/0.8)**(-0.375)) *
(0.995**Age);
				else if cystat > 0.8 then egfr_cys_cr = 146* ((creatr/0.9)**(-0.601)) * ((cystat/0.8)**(-0.711)) *
(0.995**Age);
			end;
		end;
	end;
	else do;
		if sex = 'F' then do;
			if      . < creatr <= 0.7 then do;
				egfr_cr = 144 * ((creatr/0.7)**(-0.329)) * (0.993**Age);
				if . < cystat <= 0.8 then egfr_cys_cr = 130* ((creatr/0.7)**(-0.248)) * ((cystat/0.8)**(-0.375)) *
(0.995**Age);
```

```
                              else if cystat > 0.8 then egfr_cys_cr = 130* ((creatr/0.7)**(-0.248)) * ((cystat/0.8)**(-0.711)) *
(0.995**Age);
                       end;
                       else if creatr > 0.7  then do;
                              egfr_cr = 144 * ((creatr/0.7)**(-1.209)) * (0.993**Age);
                              if . < cystat <= 0.8 then egfr_cys_cr = 130* ((creatr/0.7)**(-0.601)) * ((cystat/0.8)**(-0.375)) *
(0.995**Age);
                              else if cystat > 0.8 then egfr_cys_cr = 130* ((creatr/0.7)**(-0.601)) * ((cystat/0.8)**(-0.711)) *
(0.995**Age);
                       end;
                end;
                else do;
                       if      . < creatr <= 0.9 then do;
                              egfr_cr = 141 * ((creatr/0.9)**(-0.411)) * (0.993**Age);
                              if . < cystat <= 0.8 then egfr_cys_cr = 135* ((creatr/0.9)**(-0.207)) * ((cystat/0.8)**(-0.375)) *
(0.995**Age);
                              else if cystat > 0.8 then egfr_cys_cr = 135* ((creatr/0.9)**(-0.207)) * ((cystat/0.8)**(-0.711)) *
(0.995**Age);
                       end;
                       else if creatr > 0.9  then do;
                              egfr_cr = 141 * ((creatr/0.9)**(-1.209)) * (0.993**Age);
                              if . < cystat <= 0.8 then egfr_cys_cr = 135* ((creatr/0.9)**(-0.601)) * ((cystat/0.8)**(-0.375)) *
(0.995**Age);
                              else if cystat > 0.8 then egfr_cys_cr = 135* ((creatr/0.9)**(-0.601)) * ((cystat/0.8)**(-0.711)) *
(0.995**Age);
                       end;
                end;
        end;
        if sex = 'F' then do;
                if . < cystat <= 0.8 then egfr_cys = 133*0.932 * ((cystat/0.8)**(-0.499))*(0.996**Age);
                else if cystat > 0.8 then egfr_cys = 133*0.932 * ((cystat/0.8)**(-1.328))*(0.996**Age);
        end;
        else do;
                if . < cystat <= 0.8 then egfr_cys = 133 * ((cystat/0.8)**(-0.499))*(0.996**Age);
                else if cystat > 0.8 then egfr_cys = 133 * ((cystat/0.8)**(-1.328))*(0.996**Age);
        end;
        if val1 and val2 and pop=1 then output;

data table1 table1_new;
        set table1;
        if visit in (6,12,24,36) then output table1;
        if visit in (0,6,12,24,36) then output table1_new;

proc means data = table1 n mean std;
        var heart_rate_avg;
        class casectl visit;
        title3 'Table 1 - Heart rate';

proc means data = table1 n mean std;
```

```
        var sbp_avg;
        class casectl visit;
        title3 'Table 1 - Systolic BP';

proc means data = table1 n mean std;
        var dbp_avg;
        class casectl visit;
        title3 'Table 1 - Diastolic BP';

proc means data = table1 n mean std;
        var pp_avg;
        class casectl visit;
        title3 'Table 1 - Pulse pressure';

proc freq data = abpm_data;
        tables donor;

data abpm_data;
        set abpm_data;
        dipsys=dipsys*100;
        dipdia=dipdia*100;
        dipmap=dipmap*100;
        limitsys=limitsys*100;
        limitdia=limitdia*100;
        if donor ne .;

proc means data = abpm_data mean std;
        var duration;
        class donor;
        title3 'Table 2 - Duration of recording';

proc means data = abpm_data mean std;
        var success;
        class donor;
        title3 'Table 2 - No. of measurements';

proc means data = abpm_data mean std;
        var avgsys;
        class donor;
        title3 'Table 2 - Systolic BP';

proc means data = abpm_data mean std;
        var avgdia;
        class donor;
        title3 'Table 2 - Diastolic BP';

proc means data = abpm_data mean std;
        var avgmap;
        class donor;
```

```
        title3 'Table 2 - MAP';

proc means data = abpm_data mean std;
        var avgpp;
        class donor;
        title3 'Table 2 - Pulse pressure';

proc means data = abpm_data mean std;
        var avghr;
        class donor;
        title3 'Table 2 - Heart rate';

proc means data = abpm_data mean std;
        var dipsys;
        class donor;
        title3 'Table 2 - Systolic BP dip';

proc means data = abpm_data mean std;
        var dipdia;
        class donor;
        title3 'Table 2 - Diastolic BP dip';

proc means data = abpm_data mean std;
        var dipmap;
        class donor;
        title3 'Table 2 - MAP dip';

proc means data = abpm_data mean std;
        var limitsys;
        class donor;
        title3 'Table 2 - High systolic BP';

proc means data = abpm_data mean std;
        var limitdia;
        class donor;
        title3 'Table 2 - High diastolic BP';

proc means data = table1 n mean std;
        var slope_ihxrc;
        class casectl visit;
        title3 'Table 3 - mGFR (ml/min)';

proc means data = table1 n mean std;
        var slope_ihxsc;
        class casectl visit;
        title3 'Table 3 - mGFR (ml/min/1.73 m^2)';

proc means data = table1 n mean std;
        var creatr;
```

```
        class casectl visit;
        title3 'Table 3 - Scr';

proc means data = table1 n mean std;
        var egfr_cr;
        class casectl visit;
        title3 'Table 3 - eGFRcr';

proc means data = table1 n mean std;
        var cystat;
        class casectl visit;
        title3 'Table 3 - CysC';

proc means data = table1 n mean std;
        var egfr_cys;
        class casectl visit;
        title3 'Table 3 - eGFRcys';

proc means data = table1 n mean std;
        var egfr_cys_cr;
        class casectl visit;
        title3 'Table 3 - eGFRcr-cys';

proc means data = table1 n mean std;
        var bun;
        class casectl visit;
        title3 'Table 3 - Urea Nitrogen';

proc means data = table1 n median p25 p75;
        var urine_pcr;
        class casectl visit;
        title3 'Table 3 - Urine PCR';

proc means data = table1 n median p25 p75;
        var urine_acr;
        class casectl visit;
        title3 'Table 3 - Urine ACR';

data table1;
        set table1;
        date=date+21916;

proc sort data = table1;
        by id;

proc reg data=table1 noprint outest=slope;
        model slope_ihxrc=date;
        by id;
        run;
```

```
data slope;
       set slope;
       estimate=date*365.25;
       if estimate ne 0;

proc sort data = table1 nodupkey out = table1_ids;
       by id;

data table1_ids;
       set table1;
       by id;
       if last.id then output;

data slope5;
       merge slope (in=val1)
             table1_ids (in=val2 keep=id casectl visit age);
       by id;
       if age < 45 then age_group = 1;
       else if age >= 45 then age_group =2;
       if val1 and val2 then output;

proc means data = slope5 n mean std;
       var estimate;
       class casectl;
       title3 'Table 4 - mGFR (mL/min per y) 12-36';

proc means data = slope5 n mean std;
       var estimate;
       class casectl;
       where visit=36;
       title3 'Table 4 - mGFR (mL/min per y) 36';

proc reg data=table1 noprint outest=slope;
       model slope_ihxsc=date;
       by id;
       run;

data slope;
       set slope;
       estimate=date*365.25;
       if estimate ne 0;

data slope;
       merge slope (in=val1)
             table1_ids (in=val2 keep=id casectl visit);
       by id;
       if val1 and val2 then output;
```

```
proc means data = slope n mean std;
       var estimate;
       class casectl;
       title3 'Table 4 - mGFR (mL/min/1.73 m^2 per y) 12-36';

proc means data = slope n mean std;
       var estimate;
       class casectl;
       where visit=36;
       title3 'Table 4 - mGFR (mL/min/1.73 m^2 per y) 36';

proc reg data=table1 noprint outest=slope;
       model egfr_cr=date;
       by id;
       run;

data slope;
       set slope;
       estimate=date*365.25;
       if estimate ne 0;

data slope;
       merge slope (in=val1)
             table1_ids (in=val2 keep=id casectl visit);
       by id;
       if val1 and val2 then output;

proc means data = slope n mean std;
       var estimate;
       class casectl;
       title3 'Table 4 - eGFRcr 12-36';

proc means data = slope n mean std;
       var estimate;
       class casectl;
       where visit=36;
       title3 'Table 4 - eGFRcr 36';

proc reg data=table1 noprint outest=slope;
       model egfr_cys=date;
       by id;
       run;

data slope;
       set slope;
       estimate=date*365.25;
       if estimate ne 0;

data slope;
```

```
        merge slope (in=val1)
              table1_ids (in=val2 keep=id casectl visit);
        by id;
        if val1 and val2 then output;

proc means data = slope n mean std;
        var estimate;
        class casectl;
        title3 'Table 4 - eGFRcys 12-36';

proc means data = slope n mean std;
        var estimate;
        class casectl;
        where visit=36;
        title3 'Table 4 - eGFRcys 36';

proc reg data=table1 noprint outest=slope;
        model egfr_cys_cr=date;
        by id;
        run;

data slope;
        set slope;
        estimate=date*365.25;
        if estimate ne 0;

data slope;
        merge slope (in=val1)
              table1_ids (in=val2 keep=id casectl visit);
        by id;
        if val1 and val2 then output;

proc means data = slope n mean std;
        var estimate;
        class casectl;
        title3 'Table 4 - eGFRcr-cys 12-36';

proc means data = slope n mean std;
        var estimate;
        class casectl;
        where visit=36;
        title3 'Table 4 - eGFRcr-cys 36';

proc means data = slope5 n mean std;
        var estimate;
        class age_group casectl;
        format age_group agef.;
        title3 'Table 5 - mGFR (mL/min per y) 12-36 by age';
```

```
proc means data  = table1 n mean std;
       var hgb_new;
       class casectl visit;
       title3 'Table 6 - Hemoglobin';

proc means data  = table1 n mean std;
       var wbc_new;
       class casectl visit;
       title3 'Table 6 - Leukocyte count';

proc means data  = table1 n mean std;
       var alb;
       class casectl visit;
       title3 'Table 6 - Serum albumin';

proc means data  = table1 n median p25 p75;
       var crphs2;
       class casectl visit;
       title3 'Table 6 - CRP';

proc means data  = table1 n mean std;
       var fibr;
       class casectl visit;
       title3 'Table 6 - Fibrinogen';

proc means data  = table1 n mean std;
       var hcy;
       class casectl visit;
       title3 'Table 6 - Homocysteine';

proc means data  = table1 n mean std;
       var uric;
       class casectl visit;
       title3 'Table 6 - Uric acid';

proc means data  = table1 n mean std;
       var k;
       class casectl visit;
       title3 'Table 6 - Serum potassium';

proc means data  = table1 n mean std;
       var ca;
       class casectl visit;
       title3 'Table 6 - Serum calcium';

proc means data  = table1 n mean std;
       var phos;
       class casectl visit;
       title3 'Table 6 - Serum phosphorus';
```

```
proc means data  = table1 n mean std;
       var pthi;
       class casectl visit;
       title3 'Table 6 - PTH';

proc means data  = table1 n mean std;
       var chr;
       class casectl visit;
       title3 'Table 6 - Cholesterol';

proc means data  = table1 n mean std;
       var ldlr;
       class casectl visit;
       title3 'Table 6 - LDL cholesterol';

proc means data  = table1 n mean std;
       var hdlr;
       class casectl visit;
       title3 'Table 6 - HDL cholesterol';

proc means data  = table1 n median p25 p75;
       var trr;
       class casectl visit;
       title3 'Table 6 - Triglycerides';

proc means data  = table1 n median p25 p75;
       var lpa;
       class casectl visit;
       title3 'Table 6 - Lipoprotein (a)';

proc means data  = table1 n mean std;
       var glyhb;
       class casectl visit;
       title3 'Table 6 - Hemoglobin A1c';

proc means data  = table1 n mean std;
       var glur;
       class casectl visit;
       title3 'Table 6 - Glucose';

proc means data  = table1 n median p25 p75;
       var ins;
       class casectl visit;
       title3 'Table 6 - Insulin';
proc means data  = table1 n median p25 p75;
       var homa_ir;
       class casectl visit;
       title3 'Table 6 - HOMA-IR';
```