



APPENDIX

Table 1.1 Data for cardiac output of dogs in group I (ml/min)

| Dog        | Control | During clamp Lt renal artery | Release clamp and hypertonic NaCl infusion | $\Sigma x$ | Mean |
|------------|---------|------------------------------|--|------------|------|
| 1          | 1.63    | 1.38                         | 1.93                                       | 4.94       | 1.50 |
| 2          | 1.68    | 0.987                        | 1.23                                       | 3.90       | 1.30 |
| 3          | 1.32    | 1.30                         | 2.23                                       | 4.85       | 1.62 |
| 4          | 1.56    | 1.36                         | 1.70                                       | 4.62       | 1.54 |
| 5          | 1.19    | 0.844                        | 1.15                                       | 3.18       | 1.06 |
| 6          | 1.50    | 1.32                         | 1.63                                       | 4.45       | 1.48 |
| $\Sigma x$ | 8.86    | 7.19                         | 9.87                                       | 25.94      |      |
| Mean       | 1.48    | 1.19                         | 1.65                                       |            | 1.42 |

Calculation

$$\begin{aligned} \text{Correction Term (CT)} &= \sum_{ij} X_{ij}^2 / rt \\ &= \frac{(25.94)^2}{(6)(3)} = 37.38 \end{aligned}$$

$$\begin{aligned} \text{SS. total} &= 1.63^2 + 1.38^2 + \dots + 1.63^2 - 37.38 \\ &= 1.89 \end{aligned}$$

$$\begin{aligned} \text{SS. Block} &= \frac{4.94^2 + 3.90^2 + \dots + 4.45^2}{3} - 37.38 \\ &= 0.75 \end{aligned}$$

$$\begin{aligned} \text{SS. Treatment} &= \frac{8.88^2 + 7.19^2 + 9.87^2}{6} - 37.38 \\ &= 0.61 \end{aligned}$$

$$\text{degree of freedom of total} = (3)(6) - 1 = 17$$

$$\text{" block} = 6 - 1 = 5$$

$$\text{" treatment} = 3 - 1 = 2$$

$$\text{" error} = (6 - 1)(3 - 1) = 10$$

Table 1.2 Analysis of variance for cardiac output of dogs in group I

| Source of variation | df | SS.  | MS   | F     |
|---------------------|----|------|------|-------|
| Treatment           | 2  | 0.61 | 0.31 | 5.80* |
| Block               | 5  | 0.75 | 0.15 | 2.85  |
| Error               | 10 | 0.53 | 0.05 |       |
| Total               | 17 | 1.89 |      |       |

\*p < 0.05

Duncan's New Multiple Range Test

$$s_{\bar{x}} = \sqrt{(\text{error mean square})/r}$$

$$= 0.09$$

$$\text{df of error} = 10$$

Values of SSR at 5 %

| P values                  | 2    | 3    |
|---------------------------|------|------|
| SSR                       | 3.15 | 3.30 |
| LSR = (SSR) $s_{\bar{x}}$ | 0.28 | 0.30 |

| Group of treatment | 1    | 2    | 3    |
|--------------------|------|------|------|
| $\bar{X}$          | 1.48 | 1.19 | 1.65 |

## Comparative of treatment

|       |             |          |
|-------|-------------|----------|
| 3 - 2 | 0.46 > 0.30 | p < 0.05 |
| 3 - 1 | 0.17 < 0.28 | NS       |
| 1 - 2 | 0.29 > 0.28 | p < 0.05 |

NS = not significant.



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Dog No. 1

Rt= right kidney , Lt= left kidney

| Parameters                           | Control  | During clamp<br>renal artery         | Lt<br>Release<br>clamp               | Hypertonic<br>NaCl infusion                       |
|--------------------------------------|--|--------------------------------------|--------------------------------------|---|
| V (ml/min)                           | Rt 0.32<br>Lt 0.35   | 0.19<br>-                            | 0.18<br>-                            | 0.33<br>0.08                                      |
| EMPF(ml/min)                         | Rt 84.95<br>Lt 96.71   | 56.46<br>-                           | 53.57<br>-                           | 35.98<br>87.22                                    |
| REF(ml/ml)                           | Rt 124.92<br>Lt 142.22   | 80.66<br>-                           | 75.45<br>-                           | 49.29<br>119.48                                   |
| GFR(ml/min)                          | Rt 22.24<br>Lt 25.30   | 20.00<br>-                           | 21.38<br>-                           | 16.5<br>2.43                                      |
| FF ( % )                             | Rt 26<br>Lt 26   | 35<br>-                              | 40<br>-                              | 46<br>3   |
| RVR(dyne-sec/cm <sup>5</sup> )       | Rt 119569.9<br>Lt 105030.1   | 208236.9<br>-                        | 222456.9<br>-                        | 331212.3<br>136631.7                              |
| Renal fraction<br>( % )              | Rt 7.7<br>Lt 8.7   | 5.8<br>-                             | was not<br>measured                  | 2.6<br>6.2  |
| U <sub>Na</sub> V ( uEq/min)         | Rt 76.16<br>Lt 72.80   | 45.60<br>-                           | 25.56<br>-                           | 73.26<br>150.40                                   |
| U <sub>K</sub> V ( uEq/min)          | Rt 12.8<br>Lt 13.3   | 9.5<br>-                             | 14.4<br>-                            | 9.9<br>19.2                                       |
| U <sub>Cl</sub> V ( uEq/min)         | Rt 90.9<br>Lt 99.9   | 51.1<br>-                            | 29.5<br>-                            | 87.8<br>182.4                                     |
| Excretion<br>fraction<br>( % )       | Na Rt 2.24<br>Lt 1.88<br>K Rt 17.99<br>Lt 16.43<br>Cl Rt 3.26<br>Lt 3.16 | 1.55<br>-<br>14.39<br>-<br>1.76<br>- | 0.81<br>-<br>18.71<br>-<br>1.12<br>- | 2.94<br>40.99<br>16.22<br>213.55<br>4.16<br>58.64 |
| U/P osmolarity<br>ratio              | Rt 2.33<br>Lt 2.15   | 2.90<br>-                            | 2.92<br>-                            | 2.75<br>1.89                                      |
| C <sub>Osm</sub> (ml/min)            | Rt 0.746<br>Lt 0.753   | 0.551<br>-                           | 0.526<br>-                           | 0.906<br>1.515                                    |
| C <sub>H<sub>2</sub>O</sub> (ml/min) | Rt -0.426<br>Lt -0.403   | -0.361<br>-                          | -0.346<br>-                          | -0.576<br>-0.715                                  |
| U <sub>Osm</sub> (mOsm/L)            | Rt 706<br>Lt 652   | 914<br>-                             | 912<br>-                             | 873<br>602  |
| P <sub>Osm</sub> (mOsm/L)            | 303  | 315                                  | 312                                  | 318   |
| P <sub>Na</sub> (mEq/L)              | 150  | 147                                  | 148                                  | 151   |
| P <sub>Cl</sub> (mEq/L)              | 125  | 145                                  | 123                                  | 128   |
| P <sub>K</sub> (mEq/L)               | 3.2  | 3.3                                  | 3.6                                  | 3.7   |
| TFR(dyne-sec/cm <sup>5</sup> )       | 6231.6   | 8519.6                               | not measure                          | 6174.6  |
| CO (L/min)                           | 1.63   | 1.38                                 | "                                    | 1.93  |
| PCV ( % )                            | 32   | 30                                   | 29                                   | 27  |
| MAP ( mmHg )                         | 127  | 147                                  | 149                                  | 149   |
| FV ( liter)                          | 0.578  | 1.034                                | not measure                          | 1.564   |
| BV ( liter)                          | 0.838  | 1.456                                | "                                    | 2.142   |
| HR (beat/min)                        | 171  | 132                                  | 150                                  | 132   |
| SV (ml/beat)                         | 9.5  | 10.5                                 | not measure                          | 14.6  |



Dog No. 2

Rt = right kidney , Lt = left kidney

| Parameters                           |                         | Control              | During clamp Lt<br>renal artery | Release<br>clamp    | Hypertonic<br>NaCl infusion |
|--------------------------------------|-------------------------|----------------------|---------------------------------|---------------------|-----------------------------|
| V (ml/min)                           | Rt                      | 1.01                 | 1.67                            | 1.32                | 2.75                        |
|                                      | Lt                      | 1.05                 | -                               | -                   | 0.80                        |
| MRPF(ml/min)                         | Rt                      | 102.49               | 126.52                          | 95.79               | 167.28                      |
|                                      | Lt                      | 106.33               | -                               | -                   | 74.78                       |
| RPF(ml/min)                          | Rt                      | 193.4                | 221.9                           | 168.1               | 278.8                       |
|                                      | Lt                      | 200.6                | -                               | -                   | 124.6                       |
| GFR(ml/min)                          | Rt                      | 20.02                | 17.71                           | 12.81               | 15.65                       |
|                                      | Lt                      | 22.43                | -                               | -                   | 17.24                       |
| RVR(dyne-sec/cm <sup>5</sup> )       | Rt                      | 71013.6              | 56893.8                         | 89339.8             | 54505.7                     |
|                                      | Lt                      | 68448.9              | -                               | -                   | 121927.3                    |
| Renal fraction<br>(%)                | Rt                      | 11.5                 | 22.5                            | was not<br>measured | 22.6                        |
|                                      | Lt                      | 11.9                 | -                               | -                   | 10.1                        |
| U <sub>Na</sub> V (uEq/min)          | Rt                      | 39.39                | 65.13                           | 47.52               | 134.75                      |
|                                      | Lt                      | 55.64                | -                               | -                   | 80.80                       |
| U <sub>K</sub> V (uEq/min)           | Rt                      | 8.08                 | 15.03                           | 14.52               | 13.75                       |
|                                      | Lt                      | 11.77                | -                               | -                   | 24.80                       |
| U <sub>Cl</sub> V (uEq/min)          | Rt                      | 65.65                | 49.43                           | 49.63               | 141.63                      |
|                                      | Lt                      | 92.45                | -                               | -                   | 91.20                       |
| Excretion<br>fraction<br>(%)         | Na                      | Rt 1.08<br>Lt 1.77   | 2.61<br>-                       | 2.59<br>-           | 5.75<br>3.15                |
|                                      | K                       | Rt 10.02<br>Lt 16.93 | 28.29<br>-                      | 43.60<br>-          | 29.29<br>47.95              |
|                                      | Cl                      | Rt 2.34<br>Lt 3.82   | 2.33<br>-                       | 3.12<br>-           | 7.13<br>4.17                |
|                                      | U/P osmolarity<br>ratio | Rt 0.57<br>Lt 0.71   | 0.40<br>-                       | 0.45<br>-           | 0.44<br>1.06                |
| C <sub>Osm</sub> (ml/min)            | Rt                      | 0.573                | 0.664                           | 0.594               | 1.214                       |
|                                      | Lt                      | 0.759                | -                               | -                   | 0.752                       |
| C <sub>H<sub>2</sub>O</sub> (ml/min) | Rt                      | 0.437                | 1.006                           | 0.726               | 1.536                       |
|                                      | Lt                      | 0.311                | -                               | -                   | 0.048                       |
| U <sub>Osm</sub> (mOsm/L)            | Rt                      | 172                  | 120                             | 136                 | 139                         |
|                                      | Lt                      | 215                  | -                               | -                   | 296                         |
| P <sub>Osm</sub> (mOsm/L)            |                         | 303                  | 302                             | 302                 | 315                         |
| P <sub>Na</sub> (mEq/L)              |                         | 139                  | 141                             | 143                 | 149                         |
| P <sub>Cl</sub> (mEq/L)              |                         | 108                  | 120                             | 124                 | 127                         |
| P <sub>K</sub> (mEq/L)               |                         | 3.1                  | 3.0                             | 3.6                 | 3.7                         |
| TPR(dyne-sec/cm <sup>5</sup> )       |                         | 4332.3               | 7293.0                          | not measure         | 7388.8                      |
| CO (L/min)                           |                         | 1.68                 | 0.987                           | "                   | 1.234                       |
| PCV (%)                              |                         | 47                   | 43                              | 43                  | 40                          |
| MAP (mmHg)                           |                         | 91                   | 90                              | 107                 | 114                         |
| Hb (gm %)                            |                         | 14.73                | 13.67                           | 13.70               | 13.63                       |
| PV (liter)                           |                         | 0.524                | 0.532                           | not measure         | 0.937                       |
| BV (liter)                           |                         | 1.007                | 0.933                           | "                   | 1.615                       |
| HR (beat/min)                        |                         | 141                  | 138                             | 150                 | 153                         |
| SV (ml/beat)                         |                         | 11.9                 | 7.2                             | not measure         | 8.1                         |
| JVP (%)                              | Rt                      | 25                   | 14                              | 13                  | 9                           |
|                                      | Lt                      | 21                   | -                               | -                   | 23                          |



Group I

Dog No. 3

Rt= right kidney , Lt= left kidney

| Parameters                           | Control     | During clamp Lt renal artery | Release clamp    | Hypertonic NaCl infusion |
|--------------------------------------|-------------|------------------------------|------------------|--------------------------|
| V (ml/min)                           | Rt 0.14     | 0.38                         | 0.67             | 1.3                      |
|                                      | Lt 0.09     | -                            | -                | 0.17                     |
| ERPF(ml/min)                         | Rt 30.90    | 21.24                        | 24.26            | 31.60                    |
|                                      | Lt 21.80    | -                            | -                | 10.92                    |
| RBF (ml/min)                         | Rt 52.15    | 31.70                        | 35.68            | 45.14                    |
|                                      | Lt 33.54    | -                            | -                | 15.60                    |
| GFR (ml/min)                         | Rt 9.44     | 8.35                         | 8.61             | 9.63                     |
|                                      | Lt 4.94     | -                            | -                | 2.98                     |
| RVH(dyne-sec/cm <sup>5</sup> )       | Rt 207617.7 | 459395.5                     | 435175.6         | 344217.7                 |
|                                      | Lt 322855.1 | -                            | -                | 996087.9                 |
| Renal fraction (%)                   | Rt 3.9      | 2.4                          | was not measured | 2.0                      |
|                                      | Lt 2.5      | -                            | -                | 0.7                      |
| U <sub>Na</sub> V( uEq/min)          | Rt 10.92    | 18.24                        | 36.18            | 94.90                    |
|                                      | Lt 10.08    | -                            | -                | 19.21                    |
| U <sub>K</sub> V( uEq/min)           | Rt 1.12     | 4.56                         | 12.73            | 19.50                    |
|                                      | Lt 1.08     | -                            | -                | 7.14                     |
| U <sub>Cl</sub> V( uEq/min)          | Rt 2.20     | 4.41                         | 14.54            | 59.67                    |
|                                      | Lt 2.45     | -                            | -                | 15.91                    |
| Na                                   | Rt 0.83     | 1.55                         | 2.98             | 6.84                     |
|                                      | Lt 1.47     | -                            | -                | 4.48                     |
| Excretion fraction (%)               | Rt 2.64     | 14.00                        | 36.06            | 50.62                    |
|                                      | Lt 4.86     | -                            | -                | 59.90                    |
| Cl                                   | Rt 0.22     | 0.41                         | 1.44             | 4.59                     |
|                                      | Lt 0.47     | -                            | -                | 3.96                     |
| U/P osmolarity ratio                 | Rt 1.27     | 0.78                         | 0.70             | 0.56                     |
|                                      | Lt 1.27     | -                            | -                | 0.94                     |
| C <sub>Osm</sub> (ml/min)            | Rt 0.178    | 0.295                        | 0.467            | 0.724                    |
|                                      | Lt 0.114    | -                            | -                | 0.181                    |
| C <sub>H<sub>2</sub>O</sub> (ml/min) | Rt -0.038   | 0.085                        | 0.203            | 0.576                    |
|                                      | Lt -0.024   | -                            | -                | -0.011                   |
| U <sub>Osm</sub> (mOsm/L)            | Rt 390      | 241                          | 216              | 177                      |
|                                      | Lt 389      | -                            | -                | 339                      |
| P <sub>Osm</sub> (mOsm/L)            | 306         | 311                          | 310              | 318                      |
| P <sub>Na</sub> (uEq/L)              | 139         | 141                          | 141              | 144                      |
| P <sub>Cl</sub> (mEq/L)              | 106         | 129                          | 117              | 135                      |
| P <sub>K</sub> (mEq/L)               | 4.5         | 3.9                          | 4.1              | 4.0                      |
| TPR(dyne-sec/cm <sup>5</sup> )       | 5332.0      | 7505.8                       | not measure      | 4877.7                   |
| CO ( L/min)                          | 1.32        | 1.30                         | "                | 2.23                     |
| PCV (%)                              | 35          | 33                           | 32               | 30                       |
| MAP (mmHg)                           | 88          | 122                          | 132              | 136                      |
| Hb (gm %)                            | 11.6        | 10.65                        | 10.83            | 10.08                    |
| FV (liter)                           | 0.412       | 0.583                        | not measure      | 1.172                    |
| BV (liter)                           | 0.634       | 0.870                        | "                | 1.650                    |
| HR (beat/min)                        | 144         | 128                          | 147              | 159                      |
| SV (ml/beat)                         | 9.2         | 10.2                         | not measure      | 14.0                     |
| FF (%)                               | Rt 28       | 39                           | 36               | 31                       |
|                                      | Lt 23       | -                            | -                | 27                       |



Dog No. 4

Rt= right kidney , Lt= left kidney

| Parameters                           |    | Control  | During clamp Lt renal artery | Release clamp    | Hypertonic NaCl infusion |
|--------------------------------------|----|----------|------------------------------|------------------|--------------------------|
| V (ml/min)                           | Rt | 0.79     | 0.51                         | 0.31             | 0.46                     |
|                                      | Lt | 0.83     | -                            | -                | 0.19                     |
| ERPF(ml/min)                         | Rt | 70.44    | 42.36                        | 40.13            | 54.74                    |
|                                      | Lt | 67.86    | -                            | -                | 31.44                    |
| RER (ml/min)                         | Rt | 95.19    | 55.74                        | 52.80            | 71.09                    |
|                                      | Lt | 91.70    | -                            | -                | 40.83                    |
| GFR (ml/min)                         | Rt | 17.02    | 15.49                        | 16.97            | 26.82                    |
|                                      | Lt | 11.63    | -                            | -                | 12.07                    |
| RVR(dyne-sec/cm <sup>5</sup> )       | Rt | 109001.7 | 237900.8                     | 263078.9         | 172408.5                 |
|                                      | Lt | 113145.9 | -                            | -                | 300179.4                 |
| Renal fraction (%)                   | Rt | 6.1      | 4.1                          | was not measured | 8.3                      |
|                                      | Lt | 5.9      | -                            | -                | 2.4                      |
| U <sub>Na</sub> V (uEq/min)          | Rt | 10.27    | 16.32                        | 14.26            | 24.38                    |
|                                      | Lt | 22.41    | -                            | -                | 17.86                    |
| U <sub>K</sub> V (uEq/min)           | Rt | 33.97    | 8.67                         | 4.03             | 2.3                      |
|                                      | Lt | 45.65    | -                            | -                | 5.51                     |
| U <sub>Cl</sub> V (uEq/min)          | Rt | 72.29    | 26.06                        | 22.63            | 41.86                    |
|                                      | Lt | 87.48    | -                            | -                | 30.40                    |
| Na                                   | Rt | 0.44     | 0.76                         | 0.59             | 0.62                     |
|                                      | Lt | 1.40     | -                            | -                | 1.01                     |
| Excretion fraction (%)               | Rt | 79.84    | 18.06                        | 7.42             | 3.18                     |
|                                      | Lt | 157.01   | -                            | -                | 16.91                    |
| K                                    | Rt | 3.51     | 1.38                         | 1.04             | 1.15                     |
|                                      | Lt | 6.22     | -                            | -                | 1.85                     |
| U/P osmolarity ratio                 | Rt | 0.61     | 0.54                         | 0.79             | 0.79                     |
|                                      | Lt | 0.77     | -                            | -                | 1.18                     |
| C <sub>Osm</sub> (ml/min)            | Rt | 0.478    | 0.273                        | 0.235            | 0.365                    |
|                                      | Lt | 0.641    | -                            | -                | 0.224                    |
| C <sub>H<sub>2</sub>O</sub> (ml/min) | Rt | 0.312    | 0.237                        | 0.075            | 0.095                    |
|                                      | Lt | 0.189    | -                            | -                | -0.034                   |
| U <sub>Osm</sub> (mOsm/L)            | Rt | 178      | 159                          | 223              | 242                      |
|                                      | Lt | 227      | -                            | -                | 360                      |
| P <sub>Osm</sub> (mOsm/L)            |    | 294      | 297                          | 294              | 305                      |
| P <sub>Na</sub> (mEq/L)              |    | 138      | 138                          | 142              | 146                      |
| P <sub>Cl</sub> (mEq/L)              |    | 121      | 122                          | 128              | 136                      |
| P <sub>K</sub> (mEq/L)               |    | 2.5      | 3.1                          | 3.2              | 2.7                      |
| TPR(dyne-sec/cm <sup>5</sup> )       |    | 4921.9   | 7409.9                       | not measure      | 5551.6                   |
| CO (L/min)                           |    | 1.56     | 1.36                         | "                | 1.70                     |
| PCV (%)                              |    | 26       | 24                           | 24               | 23                       |
| MAP (mmHg)                           |    | 96       | 126                          | 132              | 118                      |
| Hb (gm %)                            |    | 9.3      | 9.7                          | 9.2              | 8.9                      |
| PV (liter)                           |    | 0.560    | 0.725                        | not measure      | 1.011                    |
| BV (liter)                           |    | 0.757    | 0.954                        | "                | 1.296                    |
| HR (beat/min)                        |    | 160      | 184                          | 180              | 156                      |
| SV (ml/beat)                         |    | 9.8      | 7.4                          | not measure      | 10.9                     |
| FF (%)                               | Rt | 24       | 37                           | 42               | 49                       |
|                                      | Lt | 17       | -                            | -                | 38                       |

## Group I

45

Dog No. 5

Rt = right kidney , Lt = left kidney

| Parameters                           |    | Control  | During clamp Lt<br>renal artery | Release<br>clamp    | Hypertonic<br>NaCl infusion |       |
|--------------------------------------|----|----------|---------------------------------|---------------------|-----------------------------|-------|
| V (ml/min)                           | Rt | 0.52     | 0.98                            | 0.70                | 1.15                        |       |
|                                      | Lt | 0.64     | -                               | -                   | 0.13                        |       |
| ERPF(ml/min)                         | Rt | 75.67    | 58.71                           | 47.78               | 100.00                      |       |
|                                      | Lt | 70.22    | -                               | -                   | 5.93                        |       |
| RBF(ml/min)                          | Rt | 114.65   | 91.73                           | 71.73               | 140.85                      |       |
|                                      | Lt | 109.72   | -                               | -                   | 8.35                        |       |
| GFR (ml/min)                         | Rt | 21.51    | 16.07                           | 18.24               | 31.09                       |       |
|                                      | Lt | 20.21    | -                               | -                   | 2.08                        |       |
| RVR(dyne-sec/cm <sup>5</sup> )       | Rt | 123664.1 | 166199.3                        | 202544.6            | 103974.0                    |       |
|                                      | Lt | 133262.0 | -                               | -                   | 1753355.8                   |       |
| Renal fraction<br>(%)                | Rt | 9.7      | 10.9                            | was not<br>measured | 12.3                        |       |
|                                      | Lt | 9.3      | -                               | -                   | 0.7                         |       |
| U <sub>Na</sub> V (uEq/min)          | Rt | 89.44    | 111.72                          | 67.90               | 121.90                      |       |
|                                      | Lt | 73.60    | -                               | -                   | 17.03                       |       |
| U <sub>K</sub> V (uEq/min)           | Rt | 8.32     | 7.84                            | 9.80                | 4.60                        |       |
|                                      | Lt | 8.96     | -                               | -                   | 0.78                        |       |
| U <sub>Cl</sub> V (uEq/min)          | Rt | 139.10   | 130.34                          | 89.60               | 172.50                      |       |
|                                      | Lt | 82.56    | -                               | -                   | 22.36                       |       |
| Na                                   | Rt | 2.95     | 4.97                            | 2.68                | 2.65                        |       |
|                                      | Lt | 2.58     | -                               | -                   | 5.53                        |       |
| Excretion<br>fraction<br>(%)         | K  | Rt       | 12.48                           | 14.35               | 15.35                       | 5.92  |
|                                      |    | Lt       | 14.30                           | -                   | -                           | 15.00 |
| Cl                                   | Rt | 5.34     | 6.59                            | 4.16                | 4.74                        |       |
|                                      | Lt | 3.38     | -                               | -                   | 9.19                        |       |
| U/P osmolarity<br>ratio              | Rt | 1.77     | 1.07                            | 1.09                | 0.92                        |       |
|                                      | Lt | 1.11     | -                               | -                   | 1.02                        |       |
| C <sub>Osm</sub> (ml/min)            | Rt | 0.921    | 1.044                           | 0.760               | 1.063                       |       |
|                                      | Lt | 0.711    | -                               | -                   | 0.132                       |       |
| C <sub>H<sub>2</sub>O</sub> (ml/min) | Rt | -0.401   | -0.064                          | -0.060              | 0.087                       |       |
|                                      | Lt | -0.071   | -                               | -                   | -0.002                      |       |
| U <sub>Osm</sub> (mOsm/L)            | Rt | 528      | 309                             | 317                 | 281                         |       |
|                                      | Lt | 331      | -                               | -                   | 309                         |       |
| P <sub>Osm</sub> (mOsm/L)            |    | 298      | 290                             | 292                 | 304                         |       |
| P <sub>Na</sub> (mEq/L)              |    | 141      | 140                             | 139                 | 148                         |       |
| P <sub>Cl</sub> (mEq/L)              |    | 121      | 123                             | 118                 | 117                         |       |
| P <sub>K</sub> (mEq/L)               |    | 3.1      | 3.4                             | 3.5                 | 2.5                         |       |
| TPR(dyne-sec/cm <sup>5</sup> )       |    | 7896.8   | 11561.1                         | not measure         | 9056.9                      |       |
| CO (l/min)                           |    | 1.19     | 0.844                           | "                   | 1.15                        |       |
| PCV (%)                              |    | 34       | 36                              | 33                  | 29                          |       |
| MAP (mmHg)                           |    | 117      | 122                             | 121                 | 130                         |       |
| Hb (gm %)                            |    | 9.71     | 10.30                           | 9.45                | 8.16                        |       |
| PV (liter)                           |    | 0.548    | 0.803                           | not measure         | 0.632                       |       |
| BV. (liter)                          |    | 0.830    | 1.255                           | "                   | 0.903                       |       |
| HR (beat/min)                        |    | 135      | 126                             | 132                 | 126                         |       |
| SV (ml/beat)                         |    | 8.8      | 6.7                             | not measure         | 9.1                         |       |
| FF (%)                               | Rt | 28       | 27                              | 38                  | 31                          |       |
|                                      | Lt | 29       | -                               | -                   | 35                          |       |



## Group I

46

Dog No. 6

Rt= right kidney , Lt= left kidney

| Parameters                           | Control     | During clamp | Lt renal artery | Release clamp    | Hypertonic NaCl infusion |
|--------------------------------------|-------------|--------------|-----------------|------------------|--------------------------|
| V (ml/min)                           | Rt 0.28     | 0.14         |                 | 0.08             | 0.14                     |
|                                      | Lt 0.33     | -            |                 | -                | 0.20                     |
| ERPF(ml/min)                         | Rt 74.28    | 53.67        |                 | 32.30            | 52.60                    |
|                                      | Lt 94.85    | -            |                 | -                | 32.46                    |
| RBF (ml/min)                         | Rt 110.9    | 77.8         |                 | 46.8             | 73.1                     |
|                                      | Lt 141.6    | -            |                 | -                | 45.1                     |
| GFR (ml/min)                         | Rt 17.9     | 18.1         |                 | 12.6             | 17.1                     |
|                                      | Lt 21.6     | -            |                 | -                | 9.2                      |
| RVH(dyne-sec/cm <sup>5</sup> )       | Rt 164740.7 | 266749.0     |                 | 460565.9         | 273695.8                 |
|                                      | Lt 129013.6 | -            |                 | -                | 443512.0                 |
| Renal fraction (%)                   | Rt 7.4      | 5.9          |                 | was not measured | 4.5                      |
|                                      | Lt 9.5      | -            |                 | -                | 2.8                      |
| U <sub>Na</sub> V ( uEq/min)         | Rt 44.5     | 11.9         |                 | 2.6              | 12.3                     |
|                                      | Lt 52.8     | -            |                 | -                | 24.8                     |
| U <sub>K</sub> V ( uEq/min)          | Rt 15.7     | 15.5         |                 | 10.9             | 11.1                     |
|                                      | Lt 17.5     | -            |                 | -                | 10.4                     |
| U <sub>Cl</sub> V ( uEq/min)         | Rt 63.6     | 9.7          |                 | 1.2              | 15.3                     |
|                                      | Lt 70.8     | -            |                 | -                | 33.4                     |
| Excretion fraction (%)               | Na Rt 1.76  | 0.47         |                 | 0.15             | 0.49                     |
|                                      | Lt 1.74     | -            |                 | -                | 1.83                     |
| K                                    | Rt 21.80    | 20.94        |                 | 21.82            | 27.49                    |
|                                      | Lt 20.27    | -            |                 | -                | 31.50                    |
| Cl                                   | Rt 3.19     | 0.41         |                 | 0.07             | 0.69                     |
|                                      | Lt 2.96     | -            |                 | -                | 2.82                     |
| U/P osmolarity ratio                 | Rt 1.99     | 2.69         |                 | -                | 2.52                     |
|                                      | Lt 1.95     | -            |                 | -                | 1.34                     |
| C <sub>Osm</sub> (ml/min)            | Rt 0.559    | 0.377        |                 | -                | 0.353                    |
|                                      | Lt 0.645    | -            |                 | -                | 0.267                    |
| C <sub>H<sub>2</sub>O</sub> (ml/min) | Rt -0.279   | -0.237       |                 | -                | -0.213                   |
|                                      | Lt -0.315   | -            |                 | -                | -0.067                   |
| U <sub>Osm</sub> (mOsm/L)            | Rt 609      | 825          |                 | -                | 786                      |
|                                      | Lt 596      | -            |                 | -                | 417                      |
| P <sub>Osm</sub> (mOsm/L)            | 305         | 306          |                 | 304              | 312                      |
| P <sub>Na</sub> (mEq/L)              | 141         | 140          |                 | 140              | 147                      |
| P <sub>Cl</sub> (mEq/L)              | 111         | 129          |                 | 133              | 129                      |
| P <sub>K</sub> (mEq/L)               | 4.0         | 4.1          |                 | 4.0              | 3.6                      |
| TPR(dyne-sec/cm <sup>5</sup> )       | 8185.2      | 10837.6      |                 | not measure      | 8821.3                   |
| CO (L/min)                           | 1.50        | 1.32         |                 | "                | 1.63                     |
| POV (%)                              | 33          | 31           |                 | 31               | 28                       |
| MAP (mmHg)                           | 153         | 179          |                 | 186              | 180                      |
| Hb (gm %)                            | 9.41        | 9.01         |                 | 9.01             | 8.75                     |
| PV (liter)                           | 0.663       | 0.656        |                 | not measure      | 0.774                    |
| BV (liter)                           | 0.975       | 0.951        |                 | "                | 1.090                    |
| HR (beat/min)                        | 153         | 162          |                 | 174              | 180                      |
| SV (ml/beat)                         | 9.8         | 8.4          |                 | not measure      | 10.9                     |
| FF (%)                               | Rt 24       | 34           |                 | 39               | 33                       |
|                                      | Lt 23       | -            |                 | -                | 28                       |

Dog No. 1

| Parameters                           | Control  | HgCl <sub>2</sub> injection | Hypertonic NaCl infusion |
|--------------------------------------|----------|-----------------------------|--------------------------|
| V (ml/min)                           | 0.40     | 0.78                        | 3.79                     |
| ERPF (ml/min)                        | 161.3    | 86.5                        | 96.9                     |
| RBF (ml/min)                         | 256.1    | 149.2                       | 158.8                    |
| GFR (ml/min)                         | 41.7     | 29.5                        | 29.3                     |
| RVR(dyne-sec/cm <sup>5</sup> )       | 143320.1 | 373642.1                    | 345672.5                 |
| FF (%)                               | 26       | 34                          | 31                       |
| Renal fraction(%)                    | 29.8     | 20.8                        | 19.4                     |
| U <sub>Na</sub> V (μEq/min)          | 3.4      | 52.8                        | 370.3                    |
| U <sub>K</sub> V (μEq/min)           | 56.0     | 60.8                        | 34.1                     |
| U <sub>Cl</sub> V (μEq/min)          | 6.9      | 89.2                        | 519.6                    |
| Excretion fraction (%)               |          |                             |                          |
| Na                                   | 0.06     | 1.18                        | 8.18                     |
| K                                    | 40.7     | 71.0                        | 48.5                     |
| Cl                                   | 0.14     | 2.70                        | 13.33                    |
| U/P osmolarity ratio                 | 1.73     | 1.20                        | 0.75                     |
| C <sub>Osm</sub> (ml/min)            | 0.691    | 0.936                       | 2.857                    |
| C <sub>H<sub>2</sub>O</sub> (ml/min) | -0.291   | -0.156                      | 0.933                    |
| U <sub>Osm</sub> (mOsm/L)            | 492      | 373                         | 239                      |
| P <sub>Osm</sub> (mOsm/L)            | 285      | 311                         | 317                      |
| P <sub>Na</sub> (mEq/L)              | 141      | 146                         | 153                      |
| P <sub>Cl</sub> (mEq/L)              | 120      | 112                         | 133                      |
| P <sub>K</sub> (mEq/L)               | 3.3      | 2.9                         | 2.4                      |
| TFR(dyne-sec/cm <sup>5</sup> )       | 6703.8   | 11250.6                     | 10181.1                  |
| CO (L/min)                           | 0.859    | 0.718                       | 0.817                    |
| PCV (%)                              | 37       | 42                          | 39                       |
| Hb (gm %)                            | 6.69     | 8.02                        | 7.50                     |
| MAP (mmHg)                           | 72       | 101                         | 104                      |
| HR (beat/min)                        | 123      | 132                         | 138                      |
| SV (ml/beat)                         | 6.9      | 5.4                         | 5.9                      |
| PV (liter)                           | 0.731    | 0.478                       | 0.464                    |
| BV (liter)                           | 1.160    | 0.824                       | 0.786                    |

Dog No. 2

| Parameters                           | Control  | HgCl <sub>2</sub> injection | Hypertonic NaCl infusion |
|--------------------------------------|----------|-----------------------------|--------------------------|
| V (ml/min)                           | 0.54     | 6.10                        | 10.72                    |
| ERPF (ml/min)                        | 116.1    | 71.2                        | 105.1                    |
| RBF (ml/min)                         | 168.2    | 120.6                       | 187.7                    |
| GFR (ml/min)                         | 45.6     | 23.9                        | 31.3                     |
| RVR(dyne-sec/cm <sup>5</sup> )       | 354096.8 | 685685.3                    | 411438.8                 |
| FF (%)                               | 40       | 34                          | 31                       |
| Renal fraction(%)                    | 18.5     | 17.9                        | 30.8                     |
| U <sub>Na</sub> V (μEq/min)          | 112.1    | 875.1                       | 1097.4                   |
| U <sub>K</sub> V (μEq/min)           | 46.44    | 65.27                       | 42.88                    |
| U <sub>Cl</sub> V (μEq/min)          | 161.7    | 1272.8                      | 1934.6                   |
| Excretion fraction (%)               |          |                             |                          |
| Na                                   | 1.7      | 27.6                        | 27.3                     |
| K                                    | 27.5     | 73.5                        | 47.3                     |
| Cl                                   | 2.95     | 37.90                       | 48.36                    |
| U/P osmolarity ratio                 | 2.48     | 1.06                        | 0.71                     |
| C <sub>Osm</sub> (ml/min)            | 1.34     | 6.49                        | 7.65                     |
| C <sub>H<sub>2</sub>O</sub> (ml/min) | -0.799   | -0.392                      | 3.068                    |
| U <sub>Osm</sub> (mOsm/L)            | 749      | 315                         | 222                      |
| P <sub>Osm</sub> (mOsm/L)            | 302      | 296                         | 311                      |
| P <sub>Na</sub> (mEq/L)              | 145      | 143                         | 149                      |
| P <sub>Cl</sub> (mEq/L)              | 120      | 140                         | 128                      |
| P <sub>K</sub> (mEq/L)               | 3.7      | 3.7                         | 2.9                      |
| TPR(dyne-sec/cm <sup>5</sup> )       | 11262.3  | 17417.9                     | 17729.6                  |
| CO (L/min)                           | 0.909    | 0.675                       | 0.609                    |
| PCV (%)                              | 31       | 41                          | 44                       |
| Hb (gm %)                            | 8.64     | 8.72                        | 7.98                     |
| MAP (mmHg)                           | 128      | 147                         | 135                      |
| HR (beat/min)                        | 192      | 216                         | 192                      |
| SV (ml/beat)                         | 4.7      | 3.1                         | 3.2                      |
| PV (liter)                           | 0.358    | 0.227                       | 0.543                    |
| BV (liter)                           | 0.519    | 0.385                       | 1.025                    |



Dog No. 3

| Parameters                           | Control  | HgCl <sub>2</sub> injection | Hypertonic NaCl infusion |
|--------------------------------------|----------|-----------------------------|--------------------------|
| V (ml/min)                           | 1.08     | 3.77                        | 5.25                     |
| ERPF (ml/min)                        | 153.8    | 66.7                        | 37.5                     |
| RBF (ml/min)                         | 274.6    | 133.5                       | 70.7                     |
| GFR (ml/min)                         | 70.6     | 19.9                        | 16.0                     |
| RVR(dyne-sec/cm <sup>5</sup> )       | 299015.9 | 747960.8                    | 1316176.9                |
| FF (%)                               | 46       | 30                          | 43                       |
| Renal fraction(%)                    | 16.2     | 10.3                        | 8.4                      |
| U <sub>Na</sub> V ( μEq/min)         | 141      | 343                         | 557.3                    |
| U <sub>K</sub> V ( μEq/min)          | 57.24    | 30.16                       | 57.75                    |
| U <sub>Cl</sub> V ( μEq/min)         | 143.9    | 442.3                       | 892.1                    |
| Excretion fraction (%)               |          |                             |                          |
| Na                                   | 1.38     | 14.08                       | 22.51                    |
| K                                    | 21.9     | 38.9                        | 109.2                    |
| Cl                                   | 1.61     | 17.51                       | 39.49                    |
| U/P osmolarity ratio                 | 1.80     | 0.81                        | 0.78                     |
| C <sub>Osm</sub> (ml/min)            | 1.94     | 3.15                        | 4.09                     |
| C <sub>H<sub>2</sub>O</sub> (ml/min) | -0.863   | 0.624                       | 1.161                    |
| U <sub>Osm</sub> (mOsm/L)            | 527      | 252                         | 243                      |
| P <sub>Osm</sub> (mOsm/L)            | 293      | 302                         | 312                      |
| P <sub>Na</sub> (mEq/L)              | 145      | 143                         | 150                      |
| P <sub>Cl</sub> (mEq/L)              | 127      | 127                         | 141                      |
| P <sub>K</sub> (mEq/L)               | 3.7      | 3.9                         | 3.3                      |
| TPR(dyne-sec/cm <sup>5</sup> )       | 6716.2   | 9664.5                      | 14203.8                  |
| CO (L/min)                           | 1.69     | 1.29                        | 0.839                    |
| PCV (%)                              | 44       | 50                          | 47                       |
| Hb (gm %)                            | 8.60     | 10.88                       | 11.18                    |
| MAP (mmHg)                           | 142      | 156                         | 149                      |
| HR (beat/min)                        | 192      | 186                         | 204                      |
| SV (ml/beat)                         | 8.8      | 6.9                         | 4.1                      |
| PV (liter)                           | 0.745    | 0.574                       | 0.753                    |
| BV (liter)                           | 1.330    | 1.148                       | 1.476                    |

Dog No. 4

| Parameters                           | Control  | HgCl <sub>2</sub> injection | Hypertonic NaCl infusion |
|--------------------------------------|----------|-----------------------------|--------------------------|
| V (ml/min)                           | 0.54     | 0.23                        | 0.51                     |
| ERPF (ml/min)                        | 85.9     | 18.8                        | 48.9                     |
| RBF (ml/min)                         | 128.2    | 29.4                        | 81.4                     |
| GFR (ml/min)                         | 29.9     | 9.3                         | 23.0                     |
| RVR(dyne-sec/cm <sup>5</sup> )       | 310760.9 | 1392489.6                   | 531301.7                 |
| FF (%)                               | 35       | 50                          | 47                       |
| Renal fraction(%)                    | 20.7     | 5.9                         | -                        |
| U <sub>Na</sub> V (μEq/min)          | 38.10    | 16.43                       | 53.80                    |
| U <sub>K</sub> V (μEq/min)           | 52.92    | 24.15                       | 53.01                    |
| U <sub>Cl</sub> V (μEq/min)          | 34.59    | 30.96                       | 64.21                    |
| Excretion fraction (%)               |          |                             |                          |
| Na                                   | 0.92     | 1.32                        | 1.65                     |
| K                                    | 50.5     | 63.3                        | 56.2                     |
| Cl                                   | 1.07     | 2.97                        | 2.20                     |
| U/P osmolarity ratio                 | 1.29     | 1.23                        | 1.14                     |
| C <sub>Osm</sub> (ml/min)            | 0.697    | 0.283                       | 0.582                    |
| C <sub>H<sub>2</sub>O</sub> (ml/min) | -0.157   | -0.053                      | -0.072                   |
| U <sub>Osm</sub> (mOsm/L)            | 387      | 349                         | 349                      |
| P <sub>Osm</sub> (mOsm/L)            | 300      | 284                         | 306                      |
| P <sub>Na</sub> (mEq/L)              | 138      | 134                         | 143                      |
| P <sub>Cl</sub> (mEq/L)              | 108      | 112                         | 127                      |
| P <sub>K</sub> (mEq/L)               | 3.5      | 4.1                         | 3.1                      |
| TPR(dyne-sec/cm <sup>5</sup> )       | 10741.7  | 13169.4                     | -                        |
| CO (L/min)                           | 0.618    | 0.495                       | -                        |
| PCV (%)                              | 33       | 36                          | 40                       |
| Hb (gm %)                            | 7.89     | 7.14                        | 9.14                     |
| MAP (mmHg)                           | 83       | 82                          | 80                       |
| HR (beat/min)                        | 156      | 108                         | 84                       |
| SV (ml/beat)                         | 3.96     | 4.6                         | -                        |
| PV (liter)                           | 0.365    | 0.397                       | -                        |
| BV (liter)                           | 0.537    | 0.620                       | -                        |



Dog No. 5

| Parameters                             | Control  | HgCl <sub>2</sub> injection | hypertonic NaCl infusion |
|--|----------|-----------------------------|--------------------------|
| V (ml/min)                             | 1.21     | 0.39                        | 0.93                     |
| MRPF (ml/min)                          | 178.32   | 54.92                       | 49.56                    |
| RBF (ml/min)                           | 270.2    | 85.8                        | 73.9                     |
| GFR (ml/min)                           | 48.0     | 53.9                        | 29.1                     |
| RVR(dyne-sec/cm <sup>5</sup> )         | 217401.5 | 780580.6                    | 871836.7                 |
| FF (%)                                 | 28       | 101                         | 59                       |
| Renal fraction(%)                      | 22.8     | 10.2                        | 6.4                      |
| U <sub>Na</sub> <sup>V</sup> (μEq/min) | 192.4    | 65.3                        | 161.6                    |
| U <sub>K</sub> <sup>V</sup> (μEq/min)  | 61.6     | 11.3                        | 13.1                     |
| U <sub>Cl</sub> <sup>V</sup> (μEq/min) | 242.2    | 30.1                        | 132.9                    |
| Excretion fraction (%)                 | Na       | 2.91                        | 0.92                     |
|  | K        | 32.9                        | 4.7                      |
|  | Cl       | 4.20                        | 0.44                     |
| U/P Osmolarity ratio                   | 1.86     | 2.19                        | 1.48                     |
| C <sub>Osm</sub> (ml/min)              | 2.249    | 0.852                       | 1.380                    |
| C <sub>H<sub>2</sub>O</sub> (ml/min)   | -1.039   | -0.462                      | -0.450                   |
| U <sub>Osm</sub> (mOsm/L)              | 565      | 671                         | 469                      |
| P <sub>Osm</sub> (mOsm/L)              | 304      | 307                         | 316                      |
| P <sub>Na</sub> (mEq/L)                | 141      | 139                         | 143                      |
| P <sub>Cl</sub> (mEq/L)                | 120      | 127                         | 133                      |
| P <sub>K</sub> (mEq/L)                 | 3.9      | 4.5                         | 4.1                      |
| TPR(dyne-sec/cm <sup>5</sup> )         | 8166.7   | 12698.3                     | 9405.3                   |
| CO (L/min)                             | 1.19     | 0.844                       | 1.15                     |
| PCV (%)                                | 34       | 36                          | 33                       |
| Hb (gm %)                              | 9.56     | 9.23                        | 9.01                     |
| MAP (mmHg)                             | 121      | 134                         | 135                      |
| HR (beat/min)                          | 174      | 168                         | 168                      |
| SV (ml/min)                            | 6.8      | 5.0                         | 6.8                      |
| PV (liter)                             | 0.548    | 0.803                       | 0.632                    |
| BV (liter)                             | 0.818    | 1.255                       | 0.958                    |



## Group II

Dog No. 6

| Parameters                     | Control  | HgCl <sub>2</sub> injection | Hypertonic NaCl infusion |
|--------------------------------|----------|-----------------------------|--------------------------|
| V (ml/min)                     | 0.47     | 0.07                        | 0.18                     |
| ERPF (ml/min)                  | 106.7    | 16.9                        | 38.4                     |
| RBF (ml/min)                   | 154.6    | 25.3                        | 54.8                     |
| GFR (ml/min)                   | 33.7     | 5.9                         | 15.4                     |
| RVR(dyne-sec/cm <sup>5</sup> ) | 255438.9 | 1644172.8                   | 856234.7                 |
| FF (%)                         | 32       | 35                          | 42                       |
| P <sub>Osm</sub> (mOsm/L)      | 293      | 297                         | 308                      |
| P <sub>Na</sub> (mEq/L)        | 135      | 135                         | 142                      |
| P <sub>Cl</sub> (mEq/L)        | 120      | 129                         | 138                      |
| P <sub>K</sub> (mEq/L)         | 3.7      | 3.6                         | 3.0                      |
| TPR(dyne-sec/cm <sup>5</sup> ) | 4547.4   | 5267.4                      | 4410.7                   |
| CO (L/min)                     | 1.50     | 1.32                        | 1.63                     |
| PCV (%)                        | 31       | 33                          | 30                       |
| Hb (gm %)                      | 9.05     | 10.58                       | 8.38                     |
| MAP (mmHg)                     | 85       | 87                          | 90                       |
| HR (beat/min)                  | 153      | 138                         | 138                      |
| SV (ml/beat)                   | 9.8      | 9.6                         | 11.8                     |
| PV (liter)                     | 0.663    | 0.656                       | 0.774                    |
| BV (liter)                     | 0.961    | 0.979                       | 1.106                    |
| Renal fraction(%)              | 10.3     | 1.9                         | 3.4                      |

## BIBLIOGRAPHY

- Arendshorst, W.J., W.F. Finn, and G.W. Gottschalk "Nephron stop-flow pressure response to obstruction for 24 hours in the rat kidney" J. Clin. Invest. 53: 1497-1500, 1974
- Arendshorst, W.J., W.F. Finn, and G.W. Gottschalk "Pathogenesis of acute renal failure following renal ischemia in the rat" Circulation Res. 37: 558-568, 1975
- Atkin, J.M., K. Wildenthal, and L.D. Horwitz "Cardiovascular responses to hypertonic mannitol in anesthetized and conscious dogs" Am. J. Physiol. 225: 132-137, 1973
- Ayer, G., A. Granchamp, T. Wyler, and B. Truniger "Intrarenal hemodynamics in glycerol-induced myohemoglobinuric acute renal failure in the rat" Circulation Res. 29: 128-135, 1971
- Baechler, R.W., T.A. Kotchen, J.H. Burke, J.H. Galla, and D. Bhatena "Consideration on the pathophysiology of mercuric chloride-induced acute renal failure" J. Lab. Clin. Med. 90: 330-340, 1977
- Bailey, R.R., R. Natale, D.I. Turnbull, and A.L. Linton "Protective effect of frusemide in acute renal tubular necrosis and acute renal failure" Clin. Sci. 45: 1-17, 1973
- Bank, N., B.F. Mutz, and H.A. Aynedjian "The role of "leakage" of tubular fluid in anuria due to mercury poisoning" J. Clin. Invest. 46: 695-704, 1976
- Blantz, R.C. "Mechanism of acute renal failure after uranyl nitrate" J. Clin. Invest. 55: 621-635, 1975
- Bohle, A., J. Jahnecke, D. Meyer, and G.E. Schubert "Morphology of acute renal failure: Comparative data from biopsy and autopsy" Kidney Int. 10: S9-S16, 1976



- Baylis, C., H.R. Ranke, and B.M. Brenner "Mechanisms of gentamycin-induced defect of glomerular filtration" Clin. Res. 25: 426A, 1977
- Chaiyabutr, N., A. Faulkner, and M. Peaker "Effects of starvation on the cardiovascular system, water balance and milk secretion in lactating goats" Res. Vet. Sci. 28: 291-295, 1980
- Chedru, M.F., R. Baethke, and D.E. Oken "Renal cortical blood flow and glomerular filtration in myohemoglobinuric acute renal failure" Kidney int. 1: 232-239, 1972
- Chew, D.J., and S.P. DiBartola: Renal failure in Quick Reference to Veterinary Medicine, edited by Fenner, W.R., p.520-534, J.B. Lippincott Co., Philadelphia Toronto, 1982
- Churchill, S., M.D. Zarlengo, J.F. Carvalho, M.N. Gottlieb, and D.E. Oken "Normal renal cortical blood flow in experimental acute renal failure" Kidney int. 11: 246-255, 1977
- Conger, J.D., J.B. Robinette, and S.J. Guggenheim "Effect of acetylcholine on the early phase of reversible norepinephrine-induced acute renal failure" Kidney int. 19: 399-409, 1981
- Cox, J.W., R.W. Baechler, H. Sharma, T. O'Dorisio, H.W. Osgood, J.H. Stein and T.F. Ferris "Studies on the mechanisms of oliguria in a model of unilateral acute renal failure" J. Clin. Invest. 53: 1546-1558, 1974
- Daugharty, T.M., I.F. Mercer, and B.M. Brenner "Dynamics of glomerular ultrafiltration in the rat. IV. Response to ischemic injury" J. Clin. Invest. 53: 105-115, 1974
- DiBona, G.F., and L.L. Sawin "The renin-angiotensin system in acute renal failure in the rat" Lab. Invest. 25: 528-532, 1971
- Donahoe, J.F., M.A. Venkatachalan, D.B. Bernard, and N.G. Levinsky "Tubular leakage and obstruction in acute ischemic renal





- failure" Kidney int. 10: 567, 1976
- Eliahou, H.E. and A. Bata "The diagnosis of acute renal failure" Nephron 2: 287, 1965
- Flamenbaum, W., S.S. McNeil, T.A. Kotchen, and A.J. Saladina "Experimental acute renal failure induced by uranyl nitrate in the dog" Circulation Res. 31: 682-698, 1972
- Flamenbaum, W., M.L. Huddleston, J.S. McNeal, and R.J. Hamburger "Uranyl nitrate-induced acute renal failure in the rat: micropuncture and renal hemodynamic studies" Kidney int. 6: 408-418, 1974
- Flores, J., D.R. DiBona, C.H. Beck, and A. Leaf "The role of cell swelling and ischemic renal damage in the protective effect of hypertonic solute" J. Clin. Invest. 51: 118-126, 1972
- Frega, N.F., D.R. DiBona, B. Guertler, and A. Leaf "Ischemic renal injury" Kidney int. 10: S17-S25, 1976
- Gazitua, S., J.B. Scott, C.C. Chou, and F.J. Haddy "Effect of osmolarity on canine renal vascular resistance" Am. J. Physiol. 217: 1216-1223, 1969
- Gazitua, S., J.B. Scott, B. Swindall, and F.J. Haddy "Resistance response to local changes in plasma osmolarity in three vascular beds" Am. J. Physiol. 220(2): 384-391, 1971
- Hsu, C.H., T.W. Kurtz, J. Goldstein, R. Keineth, J.M. Weller "Intrarenal hemodynamics in acute myohemoglobinuric renal failure" Nephron 17: 65-72, 1976
- Hsu, C.H., T.W. Kurtz, and J.M. Weller "Renal hemodynamics in  $HgCl_2$ -induced acute renal failure" Nephron 18: 326, 1977
- Hsu, C.H. and T.W. Kurtz "Renal hemodynamics in experimental acute renal failure" Nephron 27: 204-208, 1981
- Koch-Weser, J. "Influence of osmolarity of perfusate on contractility of mammalian myocardium" Am. J. Physiol. 204: 957-962, 1963

- Kolmer, J.A., G.H. Spanlding, and H.W. Robinson: Approved laboratory technic, p.66-69, Atteton-Century-Crofts, Inc. New York, 1951
- Kurtz, T.W. and C.H. Hsu "Systemic hemodynamics in  $HgCl_2$ -induced acute renal failure" Nephron, 21: 100-106, 1978
- Levinsky, N.G. and E.A. Alexander: Acute renal failure in The Kidney, edited by B.M. Brenner and F.C. Rector, p.806-837, Jr. Philadelphia: Saunder, 1976
- Loew, D. and K. Meng "Acute renal failure in experimental shock due to scalding" Kidney int. 10: S81-S85, 1976
- Lopes, O.U., V. Pontieri, M. Rocha e Silva, J.R., and I.T. Velasco "Hyperosmotic NaCl and severe hemorrhagic shock: role of the innervated lung" Am. J. Physiol. 241: H883-H890, 1981
- Luke, R.G., J.D. Briggs, M.E. Allison, and A.C. Kennedy "Factors determining response to mannitol in acute renal failure" Am. J. Physiol. 259: 168, 1970
- Marshall, R.J. and J.T. Shephard "Effects of injections of solutions on blood flow through the femoral artery of the dog" Am. J. Physiol. 197: 951-954, 1959
- Mauk, R.H., R.V. Patak, S.Z. Fadem, M.D. Lifschitz, and J.H. Stein "Effect of prostaglandin E administration in a nephrotoxic and a vasoconstrictor model of acute renal failure" Kidney int. 12: 122-130, 1977
- Michell, A.R. "Body fluids and diarrhoea: Dynamics of dysfunction" Vet. Rec. 94: 311-315, 1974
- Pinsky, M.R., P.L. Smith, E.R. Bleecker, and B.B. Barnea "Effects of antihistamines and indomethacin on hyperosmolar-induced vasodilation" Am. J. Physiol. 242: H450-H455, 1982
- Reubi, F.C., and C. Vorburger "Renal hemodynamics in acute renal failure after shock in man" Kidney int. 10: S137-S143, 1976



- Smith, H.W. : Principle of renal physiology , Oxford University Press, Inc., 1956
- Solez, K., R.J. D'Agostini, L. Stawowy, M.T. Freedman, W.W. Scott, S.S. Siegelman, and R.H. Heptinstall "Beneficial effect of propranolol in a histologically appropriate model of postischemic acute renal failure" Am. J. Physiol. 88: 163-185, 1977
- Stein, J.H., J. Gottschall, R.W. Osgood, and T.F. Ferrer "Pathophysiology of a nephrotoxic model of acute renal failure" Kidney int. 8: 27-41, 1975
- Stein, J.H., and M.I. Sorkin "Pathophysiology of a vasomotor and nephrotoxic model of acute renal failure in the dog" Kidney int. 10: S86-S93, 1976
- Stein, J.H., M.D. Lifschitz, and L.D. Barnes "Current concepts on the pathophysiology of acute renal failure" Am. J. Physiol. 234: F171-F181, 1978
- Tanner, G.A., and M. Steinhausen "Tubular obstruction in ischemic-induced acute renal failure in the rat" Kidney int. 10: S65-S73, 1976
- Templeton, G.H., J.H. Mitchell, and K. Wildenthal "Influence of hyperosmolarity on left ventricular stiffness" Am. J. Physiol. 222: 1406-1411, 1972
- Theil, G., F. Brunner, P. Wunderlich, M. Huguenin, B. Bienko, J. Torhorst, L. Peters-Haefel, E.J. Kirchertz, and G. Peters "Protection of rat kidneys against HgCl<sub>2</sub>-induced acute renal failure by induction of high urine flow without renin suppression" Kidney int. 10: S191-S200, 1976
- Thurau, K, C. Vogt, and H. Dahlheim "Renin activity in the juxtaglomerular apparatus of the kidney during postischemic acute renal failure" Kidney int. 10: S177-S182, 1976



- Tu, W.H. "Plasma renin activity in acute tubular necrosis and other renal diseases associated with hypertension" Circulation, 31: 686-695, 1965
- Velasco, I.T., V. Pontieri, JR. Rocha e Silva M., and O.U. Lopes "Hyperosmotic NaCl and severe hemorrhagic shock" Am. J. Physiol. 239: H664-H673, 1980
- White, H.L., O. Rolf, A.L. Bisno, T.S. Kasser, and D.O. Tosteson "Effect of mercurhydrin on sodium transport in proximal tubules of dogs in stop flow" Am. J. Physiol. 200: 885-889, 1961
- Wildenthal, K., C.L. Skelton, and H.N. Coleman III "Cardiac muscle mechanics in hyperosmotic solutions" Am. J. Physiol. 217: 302-306, 1969



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