THE EFFECT OF DIMETHYL SULFOXIDE ON THE CARDIOVASCULAR SYSTEM OF CATS

by

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Submitted in Partial Fulfillment of the Requirements
for the Degree of
Master of Science
in the
Biological Sciences
Program

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Dean of the Graduate School — Date

YOUNGSTOWN STATE UNIVERSITY

August, 1983

ABSTRACT

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Diastolic pressure (DP), systolic pressure (SP), pulse pressure (PP), mean arterial pressure (MAP), central venous pressure (CVP), heart rate (HR), and the R and T wave amplitudes were measured to determine the effect of intravenous dimethyl sulfoxide (DMSO) on the cardiovascular system of anesthetized cats over a 15 minute period. A statistical analysis (t-test for paired comparisons) revealed a significant effect of the drug on all of these variables. An increase in the R and T wave amplitude soon after administration of the drug was indicative of a direct effect on myocardial cells. The HR and MAP decreased rapidly, and the CVP became elevated. As the homeostatic mechanisms of the body compensated, the HR gradually returned to normal, while the MAP eventually became significantly elevated and remained so until the end of the experiment, probably due to increased cardiac output.

ACKNOWLEDGEMENTS

The author wishes to express her sincere thanks to her adviser, Dr. James R. Toepfer, for his encouragement and guidance throughout the course of this research.

Thanks to Dr. David B. MacLean for sharing his knowledge and time for the statistical analyses.

Thanks to Dr. Dale W. Fishbeck for his advice, faith and encouragement.

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LIST OF ABBREVIATIONS

ABBREVIATION	DEFINITION	UNITS
C. O.	Cardiac output	
bpm	Beats per minute	
CVP	Central venous pressure	mmHg
DMSO	Dimethyl sulfoxide	
DP	Diastolic pressure	mmHg
ECG	Electrocardiogram	
HR	Heart rate	bpm
IV	Intravenously	
MAP	Mean arterial pressure	mmHg
Max	Maximum	
Min	Minimum	
PP	Pulse pressure	mmHg
R to R interval	Distance between R wave peaks	mms
R wave	ECG deflection corresponding to ventricular depolarization	mvs
S.E.	Standard error	
SP	Systolic pressure	mmHg
SV	Stroke volume	
TPR	Total peripheral resistance	
Time		minutes: seconds
T wave	ECG deflection corresponding to ventricular repolarization	
v/v	Volume per volume	

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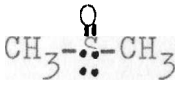
INTRODUCTION

Dimethyl sulfoxide is a relatively new and very controversial drug. In recent years it has been hailed as a "miracle drug" and the long awaited cure for arthritis. This derivative of lignin and by-product of the paper industry so far has proven extraordinary and diverse, and much work is currently in progress to further explore its potentials. Its analgesic, antiinflammatory, antiedamatous and bacteriostatic properties have made it a valuable tool of the veterinary profession. Use by physicians in the United States has only been approved for treatment of interstitial cystitis, although it is used extensively throughout Eurasia.

This research attempts to establish a pattern between the intravenous injection of DMSO in the anesthetized cat and the resulting effects on the cardiovascular system, namely the MAP, CVP, HR, and R and T wave amplitudes. The latter three are obtained from electrocardiogram (ECG) analysis.

A brief background of the chemical and pharmacological properties of DMSO is necessary for a more complete understanding of its actions. First of all, DMSO is a prominant member of the family of polar but aprotic solvents, being extremely versatile because it can act as a nucleophilic reagent at either the oxygen or sulfur terminal.

Its structure can be visualized as a tetrahedron:



The compound's polar nature, capacity to accept hydrogen bonds, and small, compact structure result in its ability to associate with water, proteins, carbohydrates, nucleic acids, ionic substances and. other constituents of living systems. This combination, as theorized. by Szmant (1975), may be related. to its ability to penetrate living tissues without causing significant damage.

Klingman (1965), using varying concentrations of DMSO, demonstrated its ability to easily cross most membranes (except nails and tooth enamel) by a reversible process. The integrity of the membranes appeared unaffected, except when very concentrated (90–100%) doses came in direct contact with the membrane, Rapid movement and generalized distribution of DMSO into nearly every tissue of the body was shown by Denko et al. (1967), Gerhards and Gibian (1967), and Kolb et al. (1967).

This penetrating ability makes it a useful vehicle for many drugs, often enhancing their actions. For example, Klingman (1965) mixed dyes and steroids with DMSO and. reported. enhanced. penetration through human skin. It has also served. as a carrier to treat viral infections, such as herpes simplex in man (Ashton et al., 1971) and

feline panleukopenia (Dake, 1967), and certain cancer chemotherapy models (Elzay, 1967). But because of this carrier effect, care must be taken when determining the dosages of drugs used in conjunction with DMSO, especially those affecting the cardiovascular and central nervous systems (Upson, 1980).

For example, nhen Smith et al. (1967) injected DMSO IV into unanesthetized cats, the LD 50 was approximately 4 g/kg; but, in experiments by DiStefano and. Klahn in 1965 with cats anesthetized using a barbituate -urethane solution, the LD 50 was less than 0.4 g/kg. Rabbits anesthetized with sodium pentobarbital required only 1.8 g/kg of DMSO IV as a lethal dose (Domer et al., 1977), while 19.2 g/kg was required to kill unanesthetized rabbits (Caujolle et al., 1967).

Cardiovascular effects of DMSO sere examined by Klingman (1965), who found topically applied DMSO to be a potent histamine-releasing agent, Histamine has a vasodilating effect on the arterioles and increases capillary porosity. This permits leakage of both fluid and plasma proteins between the blood vessels and the tissues. In a study by Bradham and Sample (1967) involving topical-DMSO application in dogs, the plasma volume showed a mean decrease of 6.476, and in another experiment the extracellular fluid showed a mean decrease of 4.3%.

The nature of the cardiac inotropic response to DMSO is highly variable in the literature researched. In experiments by Spilker in 1972, cat and dog myocardium exhibited only inhibited contractile strength in response to very modest concentrations of DMSO (0.07M), while Shlafer and Karow (1975), using rat and guinea pig myocardium, found concentrations of 0.7M or below produced positive inotropy. DMSO appears to alter the myocardial contractile strength by several mechanisms, including osmotic stress placed on the myocardial cell (Shlafer and Karow, 1975), a change in membrane permeability to water and electrolytes (Franz and Bruggen, 1967), and changes in enzyme activity (Rammler, 1967; Burges et al., 1969).

In vivo experiments examining the effects on chronotropy produced variable results also. Using anesthetized cats, DiStefano (1965) found the HR fell transiently immediately after administration of DMSO IV (200 mg/kg), but returned to normal values within five minutes. Peterson and Robertson (1967), however, recorded an increase in HR of approximately 20-30 bpm at 5000 mg and 10,000 mg DMSO IV to anesthetized dogs. After injecting 1.1-3.3 g/kg DMSO IV to anesthetized cats, Spilker (1972) observed a transient increase in HR, followed by a decrease for one or two minutes, then a return to control level.

Blood, pressure experiments also yielded variable results. DMSO was administered IV to anesthetized cats at 200 mg/kg at 15 minute intervals by DiStefano in 1965. At a cumulative dosage of 1 g/kg, the increment was doubled. The blood pressure fell transiently immediately after administration, and returned to normal within five minutes. The repeated IV administration mhere each dose was doubled led to gradually lowered blood pressure, until death at 4 g/kg.

In another experiment using anesthetized cats, Spilker (1972) injected 1.1-3.3 g DMSO/kg and obtained a biphasic response. A transient increase was followed by prolonged blood pressure depression. It returned to control level in dne to two minutes, then became slightly elevated.

In a study involving brain edema reduction by Camp et al. in 1981, a transient increase in CVP mas observed after DMSO administration. This increase peaked at five minutes, then returned to normal. However, this result was thought to be due to the large volume of-10% DMSO solution injected (approximately 27 ml to a 3 kg rabbit). When Del Bigio et al. (1982) injected the same dosage over a three hour interval, no significant change in CVP was noted.

Since several of the above experiments demonstrated a variablity of response to DMSO , this research was

undertaken using carefully controlled, experimental conditions and using a large number of replicated trials. In addition, to evaluate the total cardiovascular response, multiple parameters were examined simultaneously.

MATERIALS AND METHODS

Animals

Thirty-two healthy cats of varying age, sex, and weight were randomly selected, then paired according to sex and weight. One member of each pair was designated a control, the other an experimental (DMSO-treatment) animal. The control and, experimental groups each consisted of eleven females, two males and. three neutered males, All cats were fed. commercial dry cat food, and supplied with fresh water ad libitum.

Drugs and. Solutions

Normal saline (0.9%) was used. either for injection or as a medium for other solutions. This solution was sterilized and, kept refrigerated., but was warmed to room temperature at least one hour before use, Fresh solutions were prepared weekly.

Sodium citrate solution, used in the blood pressure detection apparatus, was prepared by dissolving 10-g of sodium citrate crystals per liter normal saline.

Heparin, used as the anticoaggulant, was prepared by dissolving 50 mg heparin per milliliter normal saline.

DMSO solution was prepared by diluting one part DMSO (1.100g/ml) to one part sterile normal saline to obtain a 50:50 v/v solution for injection.

Methoxyflurane (metofane--Pitman-Moore) was the inhalant anesthetic used during the experiments. The principal response to the drug is central nervous system depression and skeletal muscle relaxation. Light anesthetic depth was maintained by monitoring respiratory rate and skeletal muscle relaxation. This level of anesthesia had no noticeable affect on cardiovascular parameters, and, correlates most closely with plane ii of ether anesthesia.

Equipment

Two Gilson table-top Polygraphs (Model #ICT-5H) were used for the experiments. One recorded the MAP, CVP, and ECG at a chart paper speed of 2.5 mm/sec. The other recorded the ECG at 10 mm/sec. The machines were turned on at least 10 minutes prior to use to ensure proper warm-up.

Standard lead I was used for recording the ECG. The positive recording needle electrode was placed in the upper left-thoracic wall, the negative recording electrode in the upper right thoracic wall, and the ground electrode was placed in the ventral abdominal wall. These three electrodes were then connected to the respective leads of the ECG channels from each polygraph.

The MAP and CVP were each measured using a separate blood pressure apparatus. Each apparatus consisted of a

sodium citrate-filled. reservoir fitted with a calibrated. pressure gauge and. a pressure bulb. This reservoir was connected via a 3-way valve to a Stratham P23AA pressure transducer and to a PE 50 polyethylene tube which, in turn, was attached. to a catheter inserted into a blood. vessel. The 3-way valve was used. to select one of three important functions: (1) calibration, (2) sodium citrate flush of the catheter tip, and (3) recording of blood pressure. To calibrate, the 3-way valve was set so that the reservoir was connected to the pressure transducer. Thus, known pressures could be recorded on the Polygraph by using the pressure bulb and pressure gauge. The MAP channel sensitivity could then be adjusted so that 200 mmHg pressure (as indicated by the gauge) resulted in a 4 cm pen deflection. To flush the catheter tip (to prevent clotting) the 3-way valve was set so that the reservoir was connected to the catheter. Pressure aas then increased in the reservoir using the bulb so that sodium citrate could be forced into the catheter tip. To record blood pressure, the 3-way valve was set so that the catheter was connected to the pressure transducer. The pressure could then be recorded by the Polygraph.

Anesthesia

Each cat mas weighed to the nearest 10 gm, then anesthesia was induced with Metofane by inserting the

head into a plastic chamber attached to a Connel 201 Anesthetic Machine. After induction, an endotracheal tube was inserted and the cuff inflated.. This tube was then attached. to the anesthetic machine and. the amount of Metofane delivered to the animal nas adjusted throughout the experiment to maintain a constant plane of anesthesia. An oxygen flow regulator, connected. to the anesthetic machine, was adjusted to deliver 15 ml O_2/kg body weight. Suction was applied. as necessary to remove excess fluid, from the lungs and. air-passage mays.

Surgical and Experimental Procedure

Hair was clipped. from the right and. left medial thighs and from the ventral neck region. The left femoral vein, right femoral artery, and left jugular vein were dissected free from surrounding fascia, blood vessels and nerves. The femoral vein and artery were cannulated using Abbocath-T, 20-gauge, 3.2 cm IV catheters (Abbott). The catheters aere tied to the blood vessels to prevent chance dislodgement. The venous catheter was fitted with a male adapter plug (Abbott), to be use as an injection portal. The arterial catheter was attached. to the polyethylene tubing of the pressure transducer for MAP measurements. The jugular vein was catheterized. using a Venocath-18, 28 cm IV catheter (Abbott) for CVP measurements. This catheter was advanced until the tip was just

superior to the opening of the right atrium, as determine by: (1) measurement of the distance to the heart as determined. by palpation of the heart beat, (2) the slight resistance felt on the catheter when the heart mas actually entered, and (3) the recordings on the CVP channel. If, d by chance, the ventricle was entered, the pressure became noticeably greater, and the catheter was then withdrawn until these pressures disappeared. After the conclusion of several of the experiments, the animals were dissected and the catheter was noted, always to be correctly positioned.

Immediately after catheterization was complete, heparin (5 mg/kg) vras injected into the femoral portal and then forced into the circulation, as were all injections, with an injection of 0.2 ml saline.

The arterial and jugular catheters sere flushed with sodium citrate solution from their respective reservoirs, and checked for clots. Needle electrodes were attached in lead I position by insertion through the skin, and sample MAP, CVP and ECG recordings were made. The MAP and CVP calibrations were checked and the catheters flushed once more. When the tracings stabilized, either 1.0 ml/kg of sterile saline solution (control) or 1.0 ml/kg of DMSO (experimental) was injected into the venous portal. Event markers on both Polygraphs sere depressed at the beginning of the injection (time 0), and were released upon completion of the injection. In this manner an accurate

recording of the injection time was obtained.. At the end. of the experiment (15 minutes), the MAP and. CVP calibrations were once more checked. to make sure of the recording stability. The cat was then euthanized.

Measurement of Data

Values for the DP, SP, PP, MAP, CVP, HR, R and T waves are tabulated in the appendix. DP and SP values, in mmHg, were measured directly from the traces. PP was calculated using the formula PP=SP - DP. MAP values were obtained from the formula MAP=DP + 1/3(PP).

Increased precision of measurements was obtained by using a dissecting microscope (7X magnification) with a calibrated ocular scale. The CVP trace often fluctuated due to respiratory and heart-induced pressures, so the value recorded was an average.

The HR, in bpm, was calculated using the formula HR=60/(R to R interval)/chart paper speed. The R to R interval was measured with the aid of the dissecting microscope,-and the chart paper speed was 10 mm/second.

R and T wave magnitudes were taken from the ECG recorded at 10 mm/second. Again, the microscope was used to increase accuracy. The values were recorded in mvs. T waves could be positive or negative, and were occasionally diphasic. If the later was the case, the height of the tallest peak was recorded.

RESULTS

Descriptive Analysis

The mean, minimum, maximum, range, standard error and variance are presented in Tables 1-5. for MAP, CVJ?, HR, R-wave magnitude and T-wave magnitude for each of the 63 time periods measured. Missing values were eliminated. from the calculations. In addition, graphs of the mean values (±S.E.) for each of these variables against the independent variable time are plotted in Figures 1-5, respectively.

A two-tailed t-test for paired comparisons was used to analyze each of the above variables as well as the DP, SP, and PP. at the time of maximum effect (t_a) and at the end of the experiment (t_b). The data and the results of the statistical analyses are presente in Tables 6-13. For this analysis, the animals were paired. by sex and, as closely as possible, by weight. Each pair, consisting of an experimental and. a control animal, was assigned to one of 16 blocks. The t-test was performed using the difference between the values at time 0 and t_a or t_b, so that normal variations among control and. treatment animals did not affect the results. Missing values were estimated using the method, of Yates as described in Steel and Torie (1960).

TABLE 1.--Statistics for Control and Treatment MAP (mmHg)
N=16 Unless Otherwise Indicated.

Control Data Analysis

TIME	MEAN	MIN	MAX	RANGE	S.E.	VARIANCE
00:00	80.8	55.7	157.0	101.3	7.026	789.775
00:02	81.1	55.7	156.3	100.6	7.003	784.715
00:04	81.2	55.7	158.3	102.6	7.020	788.412
00:06	82.0	55.7	157.0	101.3	6.987	781.039
00:08	81.8	56.0	157.7	101.7	7.017	787.900
00:10	81.2	53.7	158.3	104.6	7.055	796.288
00:12	80.2	55.0	157.3	102.3	6.991	781.914
00:14	80.4	55.0	158.7	103.7	6.971	777.452
00:16	80.7	54.0	158.7	104.7	7.124	812.077
00:18	80.5	55.0	158.3	103.3	7.041	793.219
00:20	80.5	54.7	158.7	104.0	7.054	796.145
00:22	80.4	54.7	158.7	104.0	6.945	771.680
00:24	80.7	55.0	158.0	103.0	6.994	782.756
00:26	80.7	54.7	156.7	102.0	6.938	770.198
00:28	80.5	55.0	157.3	102.3	6.933	769.175
00:30	80.6	55.0	158.3	103.3	6.943	771.192
00:32	80.8	55.7	156.3	100.6	6.886	758.713
00:34	80.9	55.3	156.3	101.0	7.018	788.028
00:36	81.1	55.0	158.0	103.0	7.074	800.697
00:38	81.0	56.0	157.7	101.7	6.984	780.499
00:40	80.7	54.0	157.7	103.7	6.909	763.715
00:42	80.9	55.0	157.7	102.7	7.061	797.729
00:44	81.2	55.0	158.0	103.0	7.116	810.297
00:46	80.6	55.0	155.7	100.7	6.895	760.718
00:48	80.9	55.7	157.0	101.3	7.017	787.729
00:50	81.1	54.7	158.0	103.3	7.131	813.522
00:52	80.8	54.7	156.3	101.6	7.086	803.315
00:54	80.6	54.7	155.3	100.6	6.953	733.428
00:56	80.4	54.7	157.0	102.3	7.014	787.221
00:58	80.7	55.0	156.7	101.7	6.999	783.703
01:00	81.3	54.7	156.3	101.6	7.070	799.757
01:10*	76.3	53.7	124.0	70.3	5.211	407.374
01:20	81.5	53.7	157.0	103.3	6.988	781.271
01:30	81.0	53.0	157.3	104.3	6.945	771.796
01:40	81.3	52.7	156.0	103.3	6.974	778.232
01:50	81.4	52.0	156.3	104.3	7.084	802.961
02:00	81.6	52.0	154.7	102.7	6.868	754.811
02:30	81.7	51.7	156.3	104.6	6.985	780.665
03:00	81.5	50.0	155.3	105.3	6.870	755.086
03:30	81.6	49.7	152.7	103.0	6.918	756.771
04:00	81.0	49.7	151.7	102.0	6.776	734.580
04:30	81.1	50.0	151.7	101.7	6.727	724.031

*N=15 observations

TABLE 1.--Continued

TIME	MEAN	MIN	MAX	RANGE	S.E.	VARIANCE
05:00	80.4	49.3	148.3	99.0	6.576	691.828
05:30	80.2	48.0	148.3	100.3	6.369	649.001
06:00	79.8	48.0	148.7	100.7	6.265	628.046
06:30	79.3	47.7	148.3	100.6	6.223	619.618
07:00	79.1	46.7	148.7	102.0	6.222	619.389
07:30	79.5	46.3	150.0	103.7	6.252	625.406
08:00	79.8	45.3	151.7	106.4	6.433	662.169
08:30	80.1	46.3	150.7	104.4	6.258	626.529
09:00	80.8	45.7	152.3	106.6	6.289	632.774
09:30	80.9	44.7	151.7	107.0	6.333	641.759
10:00	80.6	43.7	151.0	107.3	6.391	653.463
10:30	80.9	43.7	152.7	109.0	6.381	651.492
11:00	80.7	44.3	153.0	108.7	6.460	667.780
11:30	80.3	43.3	152.3	109.0	6.447	665.042
12:00	80.0	43.3	153.0	109.7	6.443	664.184
12:30	79.6	43.0	152.0	109.0	6.383	651.867
13:00	79.6	42.0	153.0	111.0	6.487	673.294
13:30	78.9	41.7	153.0	111.3	6.419	659.309
14:00	79.2	47.0	152.0	110.0	6.430	661.606
14:30	79.3	42.3	153.7	111.4	6.489	673.621
15:00	79.3	42.0	152.3	110.3	6.367	648.597

DMSO Treatment Data Analysis

00:00	71.4	42.3	114.0	71.7	4.828	372.985
00:02	71.6	42.7	115.3	72.6	4.832	373.626
00:04	72.6	42.7	117.0	74.3	4.914	386.376
00:06	72.9	44.0	119.0	75.0	4.791	367.189
00:08	70.0	44.7	114.7	70.0	4.488	322.339
00:10	65.0	41.0	97.3	56.3	4.140	274.226
00:12	59.8	35.3	92.7	57.4	4.046	261.956
00:14	54.3	31.7	89.3	57.6	3.749	224.905
00:16	50.4	29.7	88.0	58.3	3.694	218.306
00:18	47.1	27.7	87.3	59.6	3.674	215.921
00:20	45.6	27.7	92.3	64.6	3.934	247.585
00:22	44.0	26.0	90.0	64.0	3.874	240.099
00:24	43.0	25.3	90.7	65.4	4.055	263.125
00:26	42.5	25.3	91.3	66.0	4.191	281.034
00:28	42.8	24.3	95.7	71.4	4.473	320.142
00:30	42.9	23.7	94.7	71.0	4.526	327.735
00:32	43.4	22.7	96.3	73.6	4.718	356.201
00:34	44.3	21.0	102.3	81.3	5.138	422.433
00:36	44.7	20.3	101.3	81.0	5.180	429.379
00:38	45.7	19.3	104.7	85.4	5.456	476.297
00:40	47.0	18.7	108.0	89.3	5.680	516.179
00:42	48.6	18.7	110.3	91.6	5.843	546.240
00:44	49.5	18.3	111.3	93.0	5.924	561.460

TABLE 1.--Continued

TIME	MEAN	MIN	MAX	RANGE	S.E.	VARIANCE
00:46	50.4	18.3	112.0	93.7	5.987	573.544
00:48	51.3	17.3	113.0	95.7	6.049	585.391
00:50	52.0	18.0	111.7	93.7	6.025	580.859
00:52	52.7	18.3	111.7	93.4	5.974	571.006
00:54	53.1	18.3	112.0	93.7	6.017	579.213
00:56	54.4	18.7	122.7	104.0	6.467	669.171
00:58	54.5	19.3	111.3	92.0	5.956	567.524
01:00	54.7	20.0	108.7	88.7	5.795	537.254
01:10	56.9	21.0	114.7	93.7	5.846	546.758
01:20	57.8	22.0	114.7	92.7	5.776	533.885
01:30	58.2	23.0	112.7	89.7	5.498	483.636
01:40	59.2	25.7	112.7	87.0	5.255	441.804
01:50	59.7	26.7	108.3	81.6	4.874	380.063
02:00	61.3	30.3	109.3	79.0	4.718	356.077
02:30	63.8	40.7	106.3	65.6	4.236	287.067
03:00	68.0	45.3	110.7	65.4	4.400	309.819
03:30	71.6	49.7	110.3	60.6	4.294	295.019
04:00	75.3	52.7	135.0	82.3	5.263	443.266
04:30	76.2	56.3	118.7	62.4	4.196	281.671
05:00	79.0	55.3	127.7	72.4	4.572	334.499
05:30	80.0	57.3	131.0	73.7	4.673	349.332
06:00	81.4	58.0	136.3	78.3	4.886	381.909
06:30	84.0	60.0	146.3	86.3	5.469	478.639
07:00	85.2	60.0	150.0	90.0	5.634	507.783
07:30	86.5	59.7	156.0	96.3	6.020	579.753
08:00	88.4	60.0	164.7	104.7	6.447	665.104
08:30	87.5	61.0	161.7	100.7	6.017	579.364
09:00	89.1	61.0	169.3	108.3	6.683	714.565
09:30	88.2	61.0	155.7	94.7	5.916	560.014
10:00	88.9	61.0	163.3	102.3	6.170	609.108
10:30	88.5	60.0	149.3	89.3	5.486	481.513
11:00*	86.8	61.0	129.0	68.0	4.736	336.494
11:30	85.5	62.3	109.3	47.0	3.792	230.031
12:00	85.3	61.0	108.7	47.7	3.508	196.926
12:30	86.5	62.0	115.0	53.0	4.306	296.714
13:00	84.6	61.3	112.3	51.0	3.941	248.506
13:30	85.0	59.7	117.7	58.0	4.247	288.532
14:00	85.2	59.7	116.7	57.0	4.061	263.890
14:30	85.3	59.0	119.0	60.0	4.148	275.284
15:00*	84.9	58.7	121.3	62.6	4.491	302.552

*N=15 observations

TABLE 2.--Statistics for Control and Treatment CVP (mmHg) N=16 Unless Otherwise Indicated.

Control Data Analysis

TIME	MEAN	MIN	MAX	RANGE	S.E.	VARIANCE
00:00	0.9	-0.2	2.7	2.9	0.205	0.670
00:02	1.1	-0.7	3.5	4.2	0.266	1.131
00:04	1.4	-0.5	3.5	4.0	0.282	1.273
00:06	1.5	-0.5	3.7	4.2	0.282	1.270
00:08	1.6	-0.5	3.8	4.3	0.276	1.223
00: 10	1.6	-0.5	3.7	4.2	0.262	1.095
00: 12	1.5	-0.5	3.5	4.0	0.267	1.137
00:14	1.5	-0.7	3.2	3.9	0.265	1.122
00: 16	1.4	-0.6	3.5	4.1	0.262	1.097
00:18	1.4	-0.7	3.5	4.2	0.266	1.131
00:20	1.4	-0.7	3.2	3.9	0.249	0.994
00:22	1.4	-0.7	3.2	3.9	0.254	1.034
00:24	1.4	-0.2	3.5	3.7	0.244	0.950
00:26	1.3	-0.7	3.2	3.9	0.257	1.055
00:28	1.3	-0.7	3.1	3.8	0.248	0.985
00:30*	1.3	-0.7	3.2	3.9	0.263	1.035
00:32*	1.3	-0.5	3.2	3.7	0.250	0.938
00:34*	1.2	-0.7	3.2	3.9	0.274	1.123
00:36	1.3	-0.7	3.2	3.9	0.234	0.876
00:38	1.3	-0.7	3.2	3.9	0.253	1.021
00:40	1.3	-0.7	3.4	4.1	0.252	1.018
00:42	1.2	-0.7	3.2	3.9	0.259	1.072
00:44	1.2	-0.7	3.2	3.9	0.254	1.036
00:46	1.2	-0.5	3.2	3.7	0.249	0.995
00:48	1.3	-0.5	3.2	3.7	0.233	0.872
00:50	1.2	-0.7	3.1	3.8	0.249	0.990
00:52	1.2	-0.9	3.0	3.9	0.246	0.965
00:54	1.2	-0.7	3.1	3.8	0.247	0.979
00:56	1.2	-0.5	3.4	3.9	0.255	1.037
00:58	1.2	-0.5	3.1	3.6	0.236	0.892
01:00	1.1	-0.7	3.2	3.9	0.237	0.901
01:10	1.2	-0.5	3.3	3.8	0.244	0.950
01:20	1.2	0.0	3.0	3.0	0.209	0.700
01:30	1.1	-0.7	2.7	3.4	0.239	0.917
01:40	1.1	-0.5	3.0	3.5	0.228	0.830
01:50	1.0	-0.7	2.7	3.4	0.242	0.934
02:00	0.9	-0.7	2.6	3.3	0.236	0.888
02:30	0.9	-1.0	2.7	3.7	0.242	0.936
03:00	0.9	-1.2	2.7	3.9	0.241	0.926
03:30	0.7	-1.0	2.7	3.7	0.263	1.104
04:00	0.7	-1.2	2.7	3.9	0.254	1.034

*N=15 observations

TABLE 2.--Continued.

TIME	MEAN	MIN	MAX	RANGE	S.E.	VARIANCE
04:30*	0.8	-0.5	2.5	3.0	0.214	0.690
05:00*	0.7	-1.2	2.5	3.7	0.268	1.078
05:30	0.6	-1.2	2.5	3.7	0.256	1.047
06:00	0.7	-1.5	2.5	4.0	0.238	0.908
06:30	0.7	-1.0	3.0	4.0	0.267	1.139
07:00	0.6	-1.5	3.0	4.5	0.268	1.149
07:30*	0.6	-1.7	3.0	4.7	0.286	1.224
08:00	0.7	-1.5	3.0	4.5	0.289	1.335
08:30	0.7	-1.0	2.7	3.7	0.255	1.040
09:00	0.6	-1.5	3.0	4.5	0.284	1.287
09:30	0.6	-0.7	3.0	3.7	0.249	0.992
10:00	0.5	-1.2	3.0	4.2	0.276	1.216
10:30	0.6	-1.5	2.7	4.2	0.277	1.232
11:00*	0.6	-1.0	3.0	4.0	0.288	1.246
11:30	0.5	-1.2	2.8	4.0	0.266	1.129
12:00	0.6	-1.0	2.7	3.7	0.251	1.005
12:30	0.6	-1.2	3.0	4.2	0.260	1.083
13:00	0.5	-1.0	3.0	4.0	0.254	1.034
13:30	0.5	-1.3	3.2	4.5	0.293	1.370
14:00	0.5	-1.5	3.1	4.6	0.298	1.424
14:30	0.5	-1.3	3.0	4.2	0.293	1.272
15:00	0.5	-1.6	2.9	4.5	0.292	1.362

DMSO-Treatment Data Analysis

00:00	1.5	-1.9	5.7	7.6	0.471	3.555
00:02	1.9	-1.7	6.0	7.7	0.499	3.987
00:04	2.4	-1.7	7.2	8.9	0.551	4.866
00:06	2.6	-1.7	7.7	9.4	0.576	5.309
00:08	3.0	-0.7	8.2	8.9	0.557	4.958
00:10	3.1	-0.5	7.7	8.2	0.536	4.597
00:12	3.4	0.7	8.5	7.8	0.554	4.912
00:14	3.7	1.0	9.0	8.0	0.576	5.315
00:16	4.0	1.1	10.0	8.9	0.616	6.071
00:18	4.1	1.5	10.0	8.5	0.593	5.630
00:20	4.3	1.6	10.5	8.9	0.589	5.554
00:22	4.4	1.7	10.4	8.7	0.566	5.118
00:24	4.5	1.7	10.1	8.4	0.564	5.095
00:26*	4.2	1.8	8.0	6.2	0.481	3.466
00:28	4.5	1.7	9.5	7.8	0.566	5.125
00:30	4.4	1.6	9.4	7.8	0.593	5.617
00:32	4.4	1.6	9.0	7.4	0.584	5.458
00:34	4.3	1.5	8.8	7.3	0.585	5.470

*N=15 observations

TABLE 2. --Continued.

TIME	MEAN	MIN	MAX	RANGE	S.E.	VARIANCE
00:36	4.4	1.6	8.8	7.2	0.579	5.363
00:38	4.3	1.7	8.5	6.8	0.556	4.951
00:40	4.5	1.7	8.2	6.5	0.499	3.982
00:42	4.5	2.0	8.5	6.5	0.508	4.136
00:44	4.5	2.0	8.4	6.4	0.503	4.047
00:46	4.4	1.6	8.0	6.4	0.469	3.525
00:48	4.4	2.2	7.8	5.6	0.459	3.364
00:50	4.5	2.2	7.7	5.5	0.439	3.077
00:52	4.4	2.0	7.7	5.7	0.440	3.100
00:54	4.6	2.5	8.0	5.5	0.448	3.211
00:56	4.6	2.5	7.9	5.4	0.452	3.267
00:58	4.6	2.5	8.0	5.5	0.456	3.324
01:00	4.7	2.7	8.2	5.5	0.446	3 178
01:10	4.9	2.7	8.8	6.1	0.435	3.022
01:20	5.1	2.7	9.0	6.3	0.439	3.078
01:30	5.3	3.0	8.5	5.5	0.427	2.914
01:40*	5.6	2.7	9.3	6.6	0.476	3.404
01:50	5.5	3.0	9.2	6.2	0.441	3.113
02:00	5.5	2.7	8.8	6.1	0.414	2.748
02:30	5.5	2.7	9.1	6.4	0.454	3.299
03:00	5.5	2.7	8.8	6.1	0.426	2.905
03:30	5.2	2.2	8.2	6.0	0.404	2.617
04:00	5.0	2.2	8.9	6.7	0.437	3.061
04:30	4.8	1.8	8.9	7.1	0.439	3.079
05:00	4.7	1.7	8.9	7.2	0.453	3.290
05:30	4.5	1.7	8.9	7.2	0.434	3.009
06:00	4.4	1.7	8.5	6.8	0.425	2.889
06:30	4.4	1.7	8.5	6.8	0.421	2.841
07:00	4.3	1.7	8.5	6.8	0.416	2.773
07:30	4.2	1.7	8.5	6.8	0.414	2.739
08:00	4.0	1.2	8.0	6.8	0.431	2.977
08:30	4.0	1.5	7.9	6.4	0.417	2.788
09:00	3.9	1.6	7.8	6.2	0.424	2.879
09:30	3.8	1.5	7.8	6.3	0.418	2.792
10:00*	3.9	1.2	7.5	6.3	0.437	2.859
10:30	3.7	1.7	7.5	5.8	0.399	2.544
11:00	3.7	1.5	7.5	6.0	0.390	2.435
11:30	3.7	1.4	7.2	5.8	0.377	2.277
12:00	3.6	1.2	7.0	5.8	0.385	2.371
12:30	3.6	1.1	7.0	5.9	0.419	2.809
13:00	3.5	1.0	7.0	6.0	0.407	2.645
13:30	3.4	1.1	6.5	5.4	0.395	2.493
14:00	3.3	1.1	6.5	5.4	0.403	2.598
14:30	3.4	1.0	6.8	5.8	0.419	2.803
15:00	3.4	1.0	6.5	5.5	0.387	2.391

*N= 15 observations

TABLE 3.--Statistics for Control and Treatment HR (bpm)
N=16 Unless Otherwise Indicated

Control Data Analysis

TIME	MEAN	MIN	MAX	RANGE	S.E.	VARIANCE
00:00	146.9	120.0	200.0	80.0	5.811	540.368
00:02	147.2	120.0	200.0	80.0	5.866	550.627
00:04	147.8	120.0	200.0	80.0	5.942	564.979
00:06*	148.6	120.0	200.0	80.0	5.893	520.888
00:08*	149.0	120.0	200.0	80.0	5.954	531.831
00:10	147.6	120.0	200.0	80.0	5.980	572.178
00:12	147.5	120.0	200.0	80.0	5.873	551.926
00:14*	146.0	120.0	200.0	80.0	6.116	561.122
00:16	148.2	117.1	200.0	82.9	6.267	628.497
00:18	147.0	117.1	200.0	82.9	5.916	560.003
00:20	147.6	120.0	200.0	80.0	5.938	564.137
00:22	147.3	117.1	200.0	82.9	5.932	563.073
00:24	147.0	117.1	200.0	82.9	6.097	594.835
00:26*	146.2	117.1	200.0	82.9	6.200	576.556
00:28	146.0	117.1	200.0	82.9	5.960	568.305
00:30	147.2	117.1	200.0	82.9	6.071	589.751
00:32	147.1	117.1	200.0	82.9	5.972	570.597
00:34	146.5	117.1	200.0	82.9	5.904	557.763
00:36	146.7	117.1	200.0	82.9	6.072	589.833
00:38*	149.0	120.0	200.0	80.0	5.954	531.831
00:40	146.8	117.1	200.0	82.9	5.955	567.395
00:42	146.6	120.0	200.0	80.0	5.835	544.742
00:44	146.3	117.1	200.0	82.9	5.988	573.665
00:46	147.4	120.0	200.0	80.0	6.014	578.623
00:48	146.6	120.0	200.0	80.0	5.835	544.742
00:50	146.8	120.0	200.0	80.0	5.686	517.236
00:52	146.8	120.0	200.0	80.0	6.015	578.933
00:54	146.5	120.0	200.0	80.0	6.012	578.312
00:56*	144.4	114.3	200.0	85.7	6.162	569.547
00:58*	145.5	120.0	200.0	80.0	6.216	579.589
01:00	146.4	120.0	200.0	80.0	5.890	555.066
01:10	146.5	120.0	200.0	80.0	5.935	563.635
01:20	-146.8	120.0	200.0	80.0	5.968	569.875
01:30	146.5	120.0	200.0	80.0	5.948	566.001
01:40	146.3	117.1	200.0	82.9	5.963	568.829
01:50*	144.8	114.3	200.0	85.7	6.270	589.663
02:00	145.9	117.1	200.0	82.9	5.986	573.320
02:30*	147.9	114.3	200.0	85.7	6.280	591.504
03:00**	145.0	114.3	200.0	85.7	6.995	684.985
03:30*	145.4	114.3	200.0	85.7	6.622	657.810
04:00	144.1	114.3	200.0	85.7	5.909	558.708

*N=15 observations
**N=14 observations

TABLE 3.--Continued

TIME	MEAN	MIN	MAX	RANGE	S.E.	VARIANCE
04:30	143.7	109.1	200.0	90.9	6.133	601.797
05:00	143.7	109.1	200.0	90.9	5.980	572.144
05:30	142.8	109.1	200.0	90.9	5.871	551.507
06:00	142.6	111.6	200.0	88.4	5.773	533.306
06:30	142.6	109.1	200.0	90.9	5.979	572.045
07:00	141.6	109.2	200.0	90.9	5.840	545.603
07:30	142.3	109.1	200.0	90.9	6.004	576.685
08:00	141.4	109.1	200.0	90.9	5.859	549.276
08:30	141.1	109.1	200.0	90.9	5.971	570.456
09:00	141.3	106.7	200.0	93.3	5.940	564.567
09:30	142.4	106.7	200.0	93.3	6.208	616.620
10:00*	138.0	109.1	160.0	50.9	4.856	353.746
10:30*	142.8	106.7	200.0	93.3	6.435	621.233
11:00	141.7	104.3	200.0	95.7	6.188	612.623
11:30	141.3	104.3	200.0	95.7	6.265	628.035
12:00	140.6	100.0	200.0	100.0	6.411	657.616
12:30	140.7	102.1	200.0	97.9	6.337	642.570
13:00	140.7	102.1	200.0	97.9	6.164	607.845
13:30*	143.0	100.0	200.0	100.0	6.867	707.244
14:00*	141.3	100.0	200.0	100.0	6.962	727.018
14:30	140.8	102.1	200.0	97.9	6.318	638.700
15:00	140.9	100.0	200.0	100.0	6.497	675.439

DMSO Treatment Data Analysis

00:00	146.2	75.0	200.0	125.0	7.375	870.159
00:02	145.9	73.8	200.0	126.2	7.384	872.278
00:04	146.5	77.4	200.0	122.6	7.239	838.438
00:06*	147.4	77.4	200.0	122.6	7.932	943.737
00:08**	147.6	120.0	200.0	80.0	6.619	613.340
00:10	141.8	75.0	200.0	125.0	7.691	946.460
00:12	138.7	73.8	200.0	126.2	8.078	1044.187
00:14	135.0	70.6	200.0	129.4	8.500	1156.106
00:16	133.1	68.6	200.0	131.4	8.872	1259.357
00:18	130.8	66.7	200.0	133.3	8.921	1273.489
00:20	133.3	66.7	200.0	133.3	9.014	1300.073
00:22	125.6	64.0	200.0	136.0	9.638	1486.320
00:24*	124.2	58.5	200.0	141.5	10.417	1627.601
00:26	123.9	55.8	200.0	144.2	9.775	1528.929
00:28*	119.5	55.8	184.6	128.8	8.873	1181.034
00:30	123.7	53.3	184.6	131.3	9.280	1377.861
00:32*	124.7	53.3	184.6	131.3	9.843	1453.256
00:34*	124.0	51.1	184.6	133.5	9.687	1407.514

*N= 15 observations
**N= 14 observations

TABLE 3.--Continue

TIME	MEAN	MIN	MAX	RANGE	S.E.	VARIANCE
		d				
00:36	124.8	52.2	184.6	132.4	9.122	1331.367
00:38	124.6	53.3	184.6	131.3	8.850	1253.029
00:40	124.6	53.3	177.8	124.5	8.653	1197.862
00:42	125.9	55.2	184.6	129.4	8.586	1179.554
00:44*	127.1	55.2	177.8	122.6	8.970	1206.843
00:46	126.1	55.8	177.8	122.0	8.437	1139.051
00:48	126.7	59.2	177.8	118.6	8.347	1114.732
00:50	127.3	65.7	177.8	112.1	7.985	1020.193
00:52	127.2	68.6	177.8	109.2	7.838	983.017
00:54	127.3	70.6	177.8	107.2	7.644	934.874
00:56	127.3	73.8	184.6	110.8	7.669	940.972
00:58	126.8	75.0	184.6	109.6	7.465	891.693
01:00	126.3	75.0	181.1	106.1	7.408	878.148
01:10*	130.4	80.0	184.6	104.6	7.182	773.669
01:20	127.1	76.2	184.6	108.4	7.547	911.335
01:30	127.6	77.4	184.6	107.2	7.473	893.619
01:40	128.4	76.2	184.6	108.4	7.437	884.973
01:50	129.2	75.0	184.6	109.6	7.367	868.455
02:00	129.7	75.0	181.1	106.1	7.018	787.946
02:30	131.6	72.7	184.6	111.9	6.961	775.340
03:00	132.1	72.7	184.6	111.9	6.891	759.823
03:30	131.7	70.6	177.8	107.2	6.631	703.505
04:00	132.1	71.6	181.0	109.5	6.914	764.834
04:30	132.4	70.6	184.6	114.0	6.881	757.572
05:00	133.8	70.6	184.6	114.0	7.217	833.359
05:30	132.7	70.6	177.8	107.2	7.026	789.843
06:00	133.1	68.6	184.6	116.0	7.133	814.020
06:30	132.9	68.6	184.6	116.0	7.305	853.805
07:00*	130.7	68.6	171.4	102.8	6.825	698.755
07:30*	131.5	70.6	177.8	107.2	7.194	776.246
08:00*	136.8	70.6	184.6	114.0	7.782	908.485
08:30*	135.0	70.6	192.0	121.4	8.157	997.956
09:00	135.1	68.6	184.6	116.0	7.465	891.592
09:30	136.4	68.6	184.6	116.0	7.271	845.990
10:00*	135.4	68.6	184.6	116.0	7.372	815.188
10:30*	134.9	68.6	184.6	116.0	7.619	870.675
11:00**	140.4	106.7	184.6	77.9	6.253	547.366
11:30*	135.7	68.6	192.0	123.4	7.660	880.210
12:00*	134.1	68.6	184.6	116.0	7.357	811.783
12:30	134.6	69.6	184.6	115.0	7.054	796.091
13:00	135.4	69.6	192.0	122.4	7.006	785.408
13:30	135.2	67.6	192.0	124.4	7.171	822.877
14:00*	135.8	70.6	184.6	114.0	7.339	807.959
14:30**	133.4	70.6	184.6	114.0	7.522	792.103
15:00	135.0	69.6	184.6	115.0	6.864	753.796

*N=15 observations
**N=14 observations

TABLE 4.--Statistics for Control and Treatment R Wave (mvs)
N=16 Unless Otherwise Indicated

Control Data Analysis

TIME	MEAN	MIN	MAX	RANGE	S.E.	VARIANCE
00:00	0 4 1	0.12	0.85	0.73	0.061	0.059
00:02	0.41	0.06	0.83	0.77	0.060	0.058
00:04	0.41	0.11	0.87	0.76	0.065	0.067
00:06	0.41	0	0.90	0.75	0.063	0.063
00:08*	0.44	0.11	0.91	0.80	0.066	0.066
00:10	0.43	0.14	0.87	0.73	0.062	0.061
00:12	0.42	0.12	0.85	0.73	0.061	0.060
00:14*	0.39	0.14	0.77	0.63	0.059	0.052
00:16	0.42	0.13	0.83	0.70	0.062	0.061
00:18	0.42	0.07	0.87	0.80	0.065	0.068
00:20	0.42	0.10	0.85	0.75	0.063	0.063
00:22	0.42	0.09	0.84	0.75	0.063	0.064
00:24	0.42	0.15	0.85	0.70	0.062	0.061
00:26*	0.41	0.11	0.86	0.86	0.064	0.061
00:28	0.43	0.15	0.85	0.85	0.063	0.063
00:30	0.41	0.07	0.85	0.78	0.068	0.074
00:32	0.42	0.15	0.85	0.70	0.064	0.062
00:34	0.41	0.09	0.85	0.76	0.064	0.066
00:36	0.42	0.09	0.85	0.76	0.062	0.061
00:38*	0.44	0.07	0.85	0.78	0.065	0.063
00:40	0.42	0.12	0.85	0.73	0.063	0.064
00:42	0.41	0.14	0.85	0.71	0.063	0.064
00:44	0.41	0.10	0.82	0.72	0.063	0.063
00:46	0.42	0.09	0.86	0.77	0.064	0.065
00:48	0.42	0.10	0.85	0.75	0.063	0.063
00:50	0.42	0.14	0.84	0.70	0.061	0.059
00:52	0.42	0.11	0.85	0.74	0.061	0.060
00:54*	0.42	0.09	0.85	0.76	0.069	0.072
00:56*	0.40	0.12	0.85	0.73	0.064	0.061
00:58*	0.40	0.12	0.83	0.71	0.065	0.063
01:00	0.43	0.14	0.85	0.71	0.061	0.059
01:10	0.41	0.11	0.82	0.71	0.063	0.064
01:20	0.42	0.07	0.85	0.78	0.066	0.069
01:30	0.41	0.12	0.82	0.70	0.061	0.060
01:40	0.41	0.12	0.85	0.73	0.064	0.066
01:50*	0.43	0.10	0.84	0.74	0.066	0.065
02:00	0.41	0.10	0.85	0.75	0.064	0.065
02:30	0.42	0.15	0.85	0.70	0.063	0.064
03:00**	0.43	0.14	0.86	0.72	0.071	0.070
03:30*	0.44	0.14	0.85	0.71	0.066	0.065
04:00	0.42	0.12	0.85	0.73	0.066	0.069

*N=15 observations
**N=14 observations

TABLE 4. --Continued.

TIME	MEAN	MIN	MAX	RANGE	S.E.	VARIANCE
04:30*	0.44	0.10	0.87	0.77	0.069	0.071
05:00	0.43	0.09	0.86	0.77	0.064	0.066
05:30	0.44	0.14	0.89	0.75	0.064	0.066
06:00	0.42	0.14	0.90	0.76	0.064	0.066
06:30	0.43	0.08	0.87	0.79	0.067	0.071
07:00	0.44	0.11	0.88	0.77	0.064	0.066
07:30	0.44	0.10	0.91	0.81	0.066	0.069
08:00	0.44	0.07	0.87	0.80	0.063	0.064
08:30	0.43	0.06	0.90	0.84	0.064	0.066
09:00	0.42	0.11	0.88	0.77	0.062	0.062
09:30	0.44	0.11	0.87	0.76	0.063	0.063
10:00*	0.42	0.17	0.86	0.69	0.059	0.052
10:30*	0.44	0.11	0.87	0.76	0.069	0.072
11:00	0.43	0.11	0.90	0.79	0.064	0.065
11:30*	0.45	0.11	0.87	0.76	0.065	0.063
12:00	0.44	0.12	0.91	0.79	0.067	0.072
12:30	0.44	0.12	0.90	0.78	0.066	0.070
13:00	0.43	0.07	0.85	0.78	0.064	0.065
13:30*	0.44	0.09	0.88	0.79	0.071	0.076
14:00*	0.45	0.12	0.92	0.80	0.069	0.072
14:30	0.43	0.07	0.92	0.85	0.068	0.075
15:00	0.44	0.12	0.92	0.80	0.066	0.069

DMSO Treatment Data Analysis

00:00	0.41	0.03	1.05	1.02	0.066	0.070
00:02	0.41	0.07	1.05	0.98	0.064	0.066
00:04	0.40	0.06	0.99	0.93	0.062	0.061
00:06	0.41	0.05	1.02	0.97	0.063	0.064
00:08*	0.42	0.06	0.96	0.90	0.064	0.062
00:10	0.41	0.03	0.91	0.88	0.066	0.070
00:12	0.44	0.05	1.17	1.12	0.076	0.091
00:14	0.46	0.08	1.25	1.17	0.078	0.098
00:16	0.47	0.08	1.24	1.16	0.080	0.103
00:18	0.47	0.04	1.19	1.15	0.078	0.096
00:20	0.48	0.09	1.15	1.06	0.075	0.089
00:22	0.47	0.09	1.12	1.03	0.070	0.079
00:24**	0.49	0.05	1.10	1.05	0.073	0.075
00:26	0.46	0.06	1.05	0.99	0.066	0.069
00:28*	0.49	0.06	1.09	1.03	0.068	0.069
00:30	0.45	0.07	1.05	0.98	0.066	0.069
00:32*	0.46	0.07	1.03	0.96	0.071	0.076
00:34	0.45	0.07	1.05	0.98	0.068	0.075

*N=15 observations
**N=14 observations

TABLE 4.--Continued.

TIME	MEAN	MIN	MAX	RANGE	S.E.	VARIANCE
00:36	0.45	0.09	1.05	0.96	0.066	0.069
00:38	0.45	0.09	1.02	0.93	0.066	0.069
00:40	0.44	0.09	0.95	0.86	0.062	0.061
00:42	0.45	0.09	0.95	0.86	0.062	0.062
00:44*	0.40	0.09	0.81	0.72	0.051	0.040
00:46	0.44	0.07	0.89	0.82	0.058	0.054
00:48	0.44	0.09	0.85	0.76	0.056	0.051
00:50	0.44	0.07	0.87	0.80	0.060	0.057
00:52	0.42	0.06	0.89	0.83	0.057	0.052
00:54	0.43	0.06	0.90	0.84	0.056	0.051
00:56	0.41	0.06	0.81	0.75	0.052	0.043
00:58*	0.45	0.05	0.87	0.82	0.057	0.048
01:00*	0.42	0.06	0.94	0.88	0.061	0.055
01:10	0.42	0.04	0.91	0.87	0.056	0.049
01:20	0.39	0.02	0.90	0.88	0.059	0.056
01:30	0.37	0.01	0.90	0.89	0.058	0.054
01:40	0.37	0.01	0.88	0.87	0.058	0.054
01:50	0.35	0.01	0.87	0.86	0.059	0.056
02:00	0.35	0.01	0.87	0.86	0.058	0.053
02:30	0.34	0.01	0.84	0.83	0.057	0.052
03:00	0.34	0.01	1.05	1.04	0.065	0.068
03:30*	0.32	0.02	0.62	0.60	0.049	0.037
04:00	0.35	0.02	0.84	0.82	0.056	0.050
04:30	0.36	0.05	0.83	0.78	0.055	0.048
05:00	0.36	0.02	0.84	0.82	0.055	0.048
05:30	0.36	0.05	0.83	0.78	0.054	0.047
06:00	0.38	0.06	0.83	0.77	0.057	0.052
06:30	0.38	0.04	0.84	0.80	0.054	0.046
07:00*	0.38	0.03	0.91	0.88	0.063	0.060
07:30*	0.39	0.07	0.90	0.83	0.061	0.056
08:00*	0.37	0.06	0.87	0.81	0.058	0.050
08:30*	0.39	0.06	0.90	0.84	0.062	0.057
09:00	0.40	0.08	0.90	0.82	0.057	0.052
09:30	0.40	0.08	0.91	0.83	0.056	0.050
10:00*	0.41	0.07	0.90	0.83	0.055	0.045
10:30*	0.41	0.06	0.93	0.87	0.061	0.056
11:00**	0.44	0.07	0.93	0.86	0.061	0.051
11:30*	0.42	0.07	0.91	0.84	0.057	0.049
12:00	0.39	0.02	0.96	0.94	0.061	0.059
12:30	0.41	0.02	0.97	0.95	0.061	0.059
13:00	0.39	0.02	0.96	0.94	0.060	0.058
13:30	0.41	0.02	0.99	0.97	0.063	0.063
14:00*	0.41	0.02	1.06	1.04	0.070	0.073
14:30**	0.39	0.05	0.99	0.94	0.068	0.064
15:00	0.40	0.05	0.98	0.93	0.059	0.055

*N=15 observations
**N=14 observations

TABLE 5.--Statistics for Control and Treatment T Wave (mvs) N=16 Unless Otherwise Indicated.

Control Data Analysis

TIME	MEAN	MIN	MAX	RANGE	S.E.	VARIANCE
00:00	0.19	0.01	0.69	0.68	0.048	0.036
00:02	0.19	0.01	0.69	0.68	0.048	0.036
00:04	0.21	0.01	0.69	0.68	0.049	0.038
00:06	0.23	0.01	0.69	0.68	0.051	0.041
00:08*	0.23	0.01	0.70	0.69	0.055	0.045
00:10	0.22	0.01	0.69	0.68	0.052	0.043
00:12	0.22	0.01	0.69	0.68	0.051	0.041
00:14**	0.19	0.00	0.69	0.69	0.053	0.040
00:16	0.20	0.01	0.67	0.66	0.049	0.038
00:18	0.19	0.01	0.67	0.67	0.047	0.035
00:20	0.18	0.01	0.66	0.65	0.047	0.036
00:22	0.18	0.01	0.64	0.63	0.046	0.034
00:24	0.18	0.00	0.67	0.67	0.046	0.034
00:26*	0.18	0.01	0.63	0.62	0.047	0.033
00:28	0.18	0.01	0.66	0.65	0.046	0.034
00:30	0.18	0.00	0.64	0.64	0.045	0.032
00:32	0.19	0.00	0.66	0.66	0.046	0.034
00:34	0.18	0.01	0.64	0.63	0.044	0.032
00:36	0.18	0.01	0.66	0.65	0.046	0.034
00:38*	0.19	0.01	0.64	0.63	0.046	0.031
00:40	0.19	0.00	0.67	0.67	0.047	0.035
00:42	0.18	0.01	0.63	0.62	0.044	0.031
00:44	0.18	0.01	0.66	0.65	0.046	0.033
00:46	0.18	0.01	0.63	0.62	0.045	0.033
00:48	0.18	0.00	0.64	0.64	0.045	0.033
00:50	0.18	0.00	0.63	0.63	0.043	0.030
00:52*	0.19	0.01	0.66	0.65	0.047	0.034
00:54	0.18	0.01	0.63	0.62	0.044	0.032
00:56*	0.19	0.01	0.66	0.65	0.048	0.035
00:58*	0.18	0.01	0.63	0.62	0.048	0.034
01:00	0.18	0.00	0.66	0.66	0.046	0.034
01:10	0.18	0.01	0.64	0.63	0.045	0.032
01:20	0.18	0.01	0.66	0.65	0.046	0.034
01:30	0.18	0.01	0.66	0.65	0.045	0.032
01:40	0.18	0.01	0.61	0.60	0.045	0.032
01:50*	0.17	0.01	0.63	0.62	0.043	0.028
02:00	0.19	0.01	0.64	0.63	0.044	0.032
02:30	0.18	0.00	0.61	0.61	0.045	0.032
03:00**	0.20	0.00	0.61	0.61	0.050	0.034
03:30*	0.21	0.00	0.61	0.61	0.046	0.032
04:00	0.19	0.01	0.61	0.60	0.044	0.031

*N=15 observations
**N=14 observations

TABLE 5.--Continued.

TIME	MEAN	MIN	MAX	RANGE	S.E.	VARIANCE
04:30*	0.20	0.00	0.67	0.67	0.049	0.036
05:00	0.19	0.00	0.64	0.64	0.045	0.033
05:30	0.18	0.00	0.61	0.61	0.045	0.032
06:00	0.19	0.00	0.60	0.60	0.044	0.031
06:30	0.18	0.00	0.63	0.63	0.045	0.033
07:00	0.20	0.00	0.66	0.66	0.046	0.034
07:30	0.20	0.00	0.66	0.66	0.046	0.034
08:00	0.19	0.00	0.64	0.64	0.046	0.034
08:30	0.20	0.00	0.61	0.61	0.045	0.033
09:00	0.19	0.00	0.63	0.63	0.045	0.032
09:30	0.19	0.00	0.58	0.58	0.042	0.028
10:00**	0.19	0.00	0.63	0.63	0.051	0.036
10:30*	0.21	0.20	0.63	0.61	0.046	0.032
11:00	0.19	0.01	0.58	0.57	0.044	0.030
11:30*	0.20	0.01	0.61	0.60	0.045	0.030
12:00	0.18	0.01	0.60	0.59	0.044	0.030
12:30	0.18	0.01	0.58	0.57	0.043	0.030
13:00	0.19	0.01	0.58	0.57	0.043	0.029
13:30*	0.20	0.01	0.58	0.57	0.043	0.028
14:00*	0.20	0.01	0.58	0.57	0.043	0.028
14:30	0.19	0.01	0.57	0.56	0.041	0.027
15:00	0.19	0.01	0.57	0.56	0.042	0.028

DMSO-Treatment Data Analysis

00:00	0.12	0.00	0.30	0.30	0.025	0.010
00:02	0.12	0.00	0.35	0.35	0.026	0.011
00:04	0.12	0.00	0.32	0.32	0.026	0.011
00:06	0.13	0.00	0.35	0.35	0.028	0.013
00:08*	0.14	0.00	0.40	0.40	0.030	0.014
00:10	0.13	0.01	0.50	0.49	0.034	0.019
00:12	0.14	0.01	0.51	0.50	0.034	0.019
00:14	0.16	0.00	0.56	0.56	0.039	0.024
00:16	0.17	0.00	0.60	0.60	0.039	0.025
00:18	0.18	0.00	0.62	0.62	0.041	0.026
00:20	0.22	0.00	0.64	0.64	0.049	0.039
00:22	0.23	0.00	0.65	0.65	0.050	0.040
00:24*	0.25	0.00	0.65	0.65	0.053	0.042
00:26	0.24	0.00	0.65	0.65	0.053	0.044
00:28*	0.27	0.01	0.70	0.69	0.055	0.046
00:30	0.24	0.00	0.70	0.70	0.056	0.049
00:32*	0.22	0.00	0.74	0.74	0.055	0.046
00:34*	0.26	0.00	0.77	0.77	0.060	0.054
00:36	0.23	0.00	0.75	0.75	0.057	0.052

*N=15 observations
**N=14 observations

TABLE 5.--Continued.

TIME	MEAN	MIN	MAX	RANGE	S.E.	VARIANCE
00:38	0.22	0.00	0.75	0.75	0.053	0.045
00:40	0.25	0.00	0.75	0.75	0.061	0.059
00:42	0.24	0.00	0.75	0.75	0.059	0.055
00:44*	0.21	0.00	0.60	0.60	0.049	0.036
00:46	0.24	0.00	0.75	0.75	0.059	0.056
00:48	0.25	0.00	0.75	0.75	0.058	0.054
00:50	0.22	0.00	0.67	0.67	0.050	0.039
00:52	0.21	0.00	0.65	0.65	0.048	0.037
00:54	0.21	0.00	0.60	0.60	0.046	0.033
00:56*	0.21	0.01	0.55	0.54	0.044	0.029
00:58*	0.21	0.01	0.52	0.51	0.044	0.028
01:00	0.19	0.00	0.50	0.50	0.042	0.028
01:10	0.18	0.01	0.42	0.41	0.036	0.021
01:20*	0.17	0.02	0.40	0.38	0.035	0.019
01:30	0.15	0.02	0.35	0.33	0.028	0.012
01:40	0.13	0.01	0.35	0.34	0.027	0.011
01:50	0.13	0.01	0.40	0.39	0.028	0.013
02:00	0.12	0.01	0.37	0.36	0.025	0.010
02:30	0.11	0.02	0.32	0.30	0.023	0.008
03:00	0.11	0.02	0.32	0.30	0.022	0.008
03:30*	0.11	0.01	0.30	0.29	0.023	0.008
04:00	0.11	0.01	0.29	0.28	0.021	0.007
04:30	0.10	0.01	0.30	0.29	0.021	0.007
05:00	0.10	0.00	0.32	0.32	0.024	0.009
05:30	0.10	0.00	0.31	0.31	0.022	0.008
06:00	0.10	0.00	0.33	0.33	0.025	0.010
06:30	0.10	0.00	0.35	0.35	0.025	0.010
07:00*	0.09	0.00	0.34	0.34	0.026	0.010
07:30*	0.09	0.00	0.34	0.34	0.025	0.009
08:00*	0.09	0.00	0.30	0.30	0.024	0.009
08:30*	0.10	0.00	0.30	0.30	0.025	0.009
09:00	0.09	0.00	0.30	0.30	0.020	0.006
09:30	0.10	0.00	0.30	0.30	0.023	0.008
10:00*	0.10	0.00	0.30	0.30	0.024	0.008
10:30*	0.11	0.00	0.30	0.30	0.025	0.010
11:00**	0.10	0.01	0.30	0.29	0.025	0.009
11:30*	0.10	0.01	0.33	0.32	0.027	0.011
12:00	0.10	0.01	0.34	0.33	0.025	0.010
12:30	0.10	0.01	0.32	0.32	0.024	0.009
13:00	0.11	0.02	0.36	0.34	0.026	0.011
13:30	0.11	0.01	0.36	0.35	0.027	0.012
14:00*	0.11	0.01	0.32	0.31	0.027	0.011
14:30**	0.13	0.02	0.35	0.33	0.029	0.012
15:00	0.11	0.01	0.39	0.38	0.028	0.013

*N=15 observations
**N=14 observations

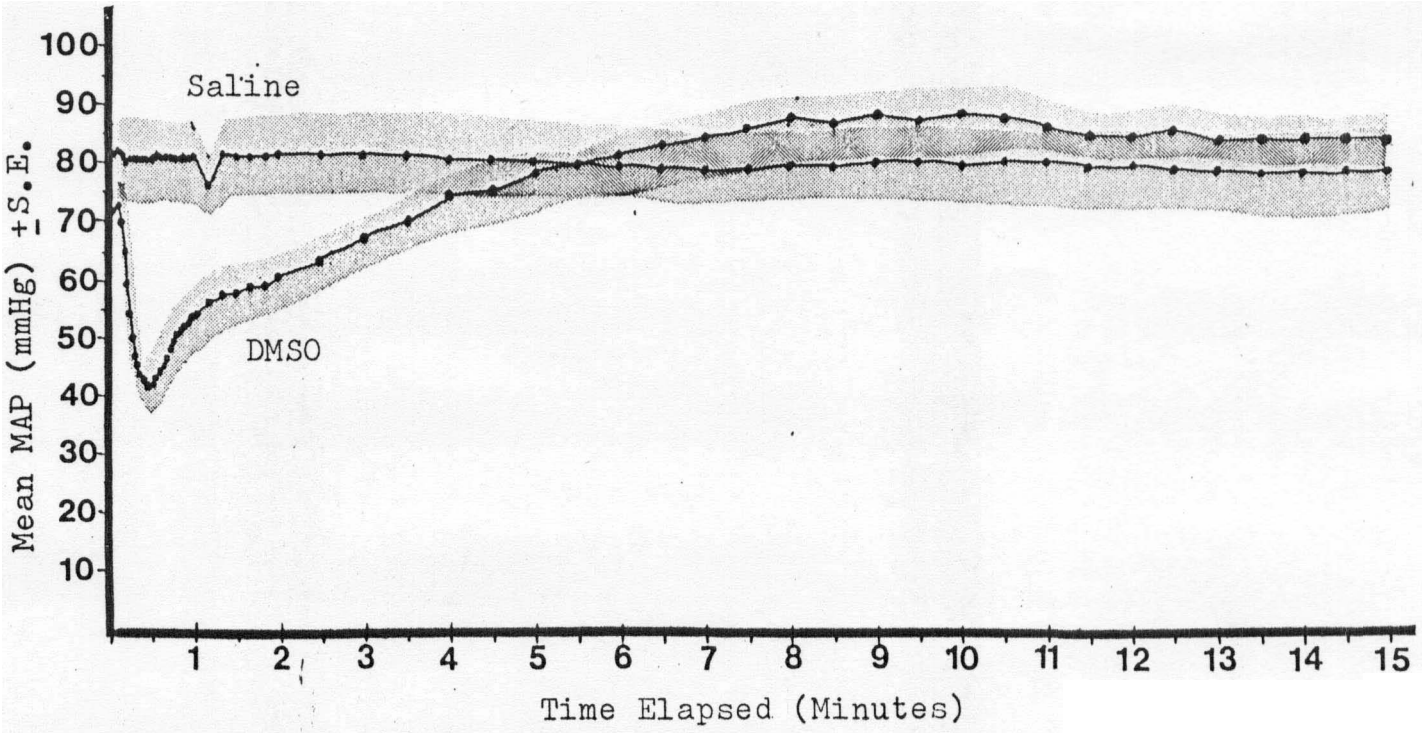


Figure 1. Graph of mean MAP (mmHg) +S.E. (shaded area) against time (minutes) after injection of saline (control) or DMSO (experimental).

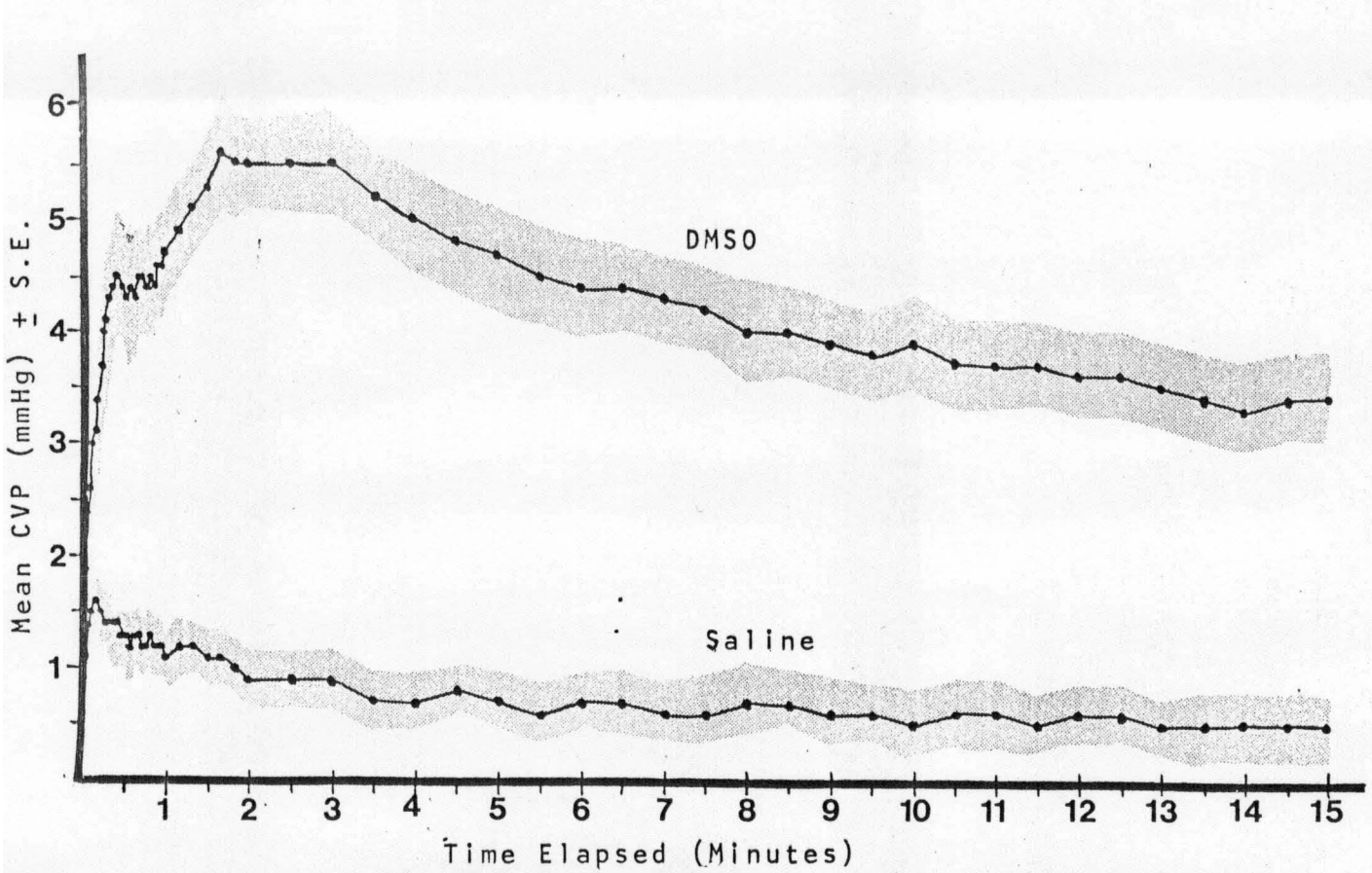


Figure 2. Graph of mean CVP (mmHg) + S.E. (shaded area) against time (minutes) after injection of saline (control) or DMSO (experimental).

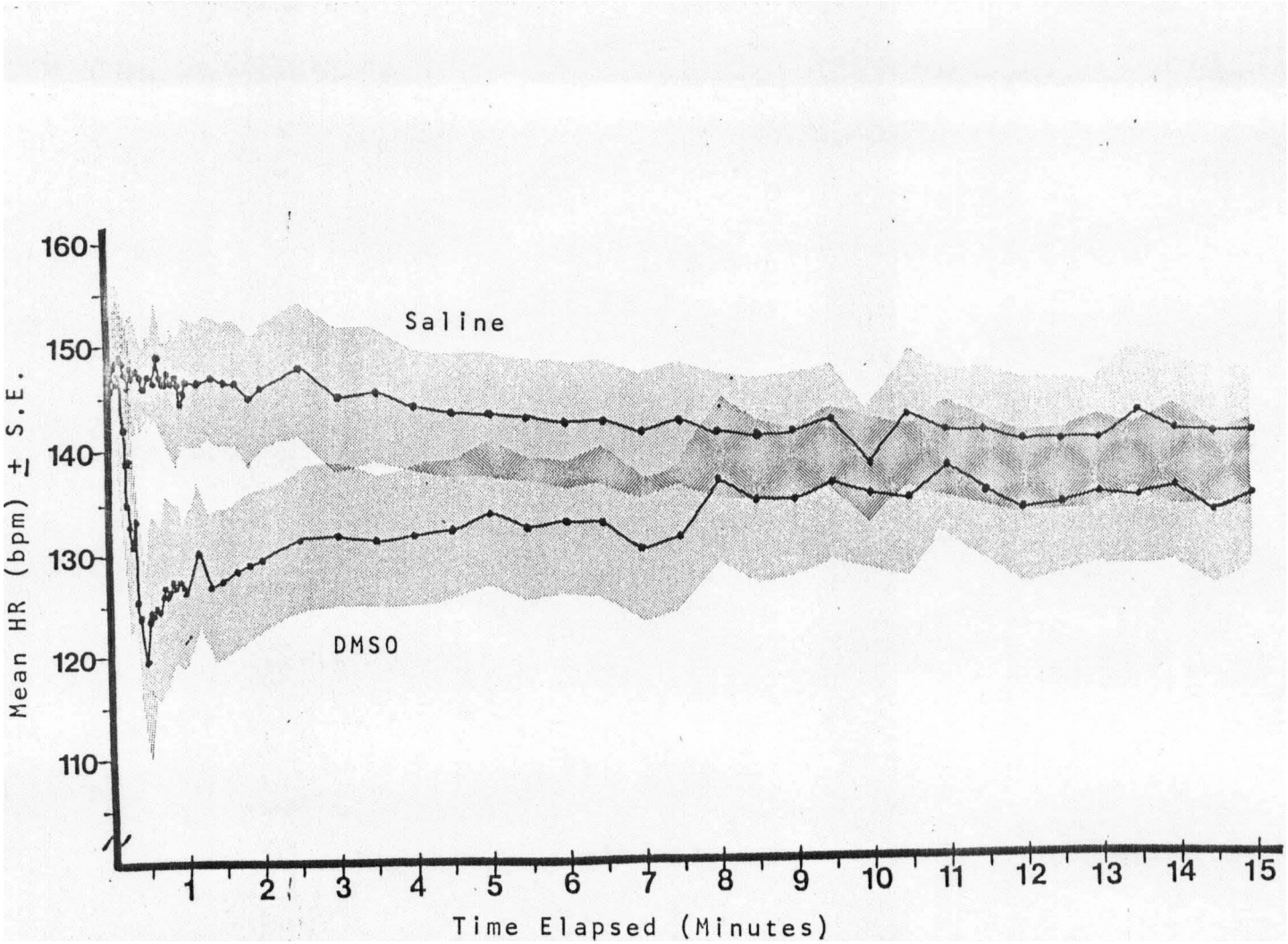


Figure 3. Graph of HR (bpm) + S.E. (shaded area) against time (minutes) after injection of saline (control) or DMSO (experimental).

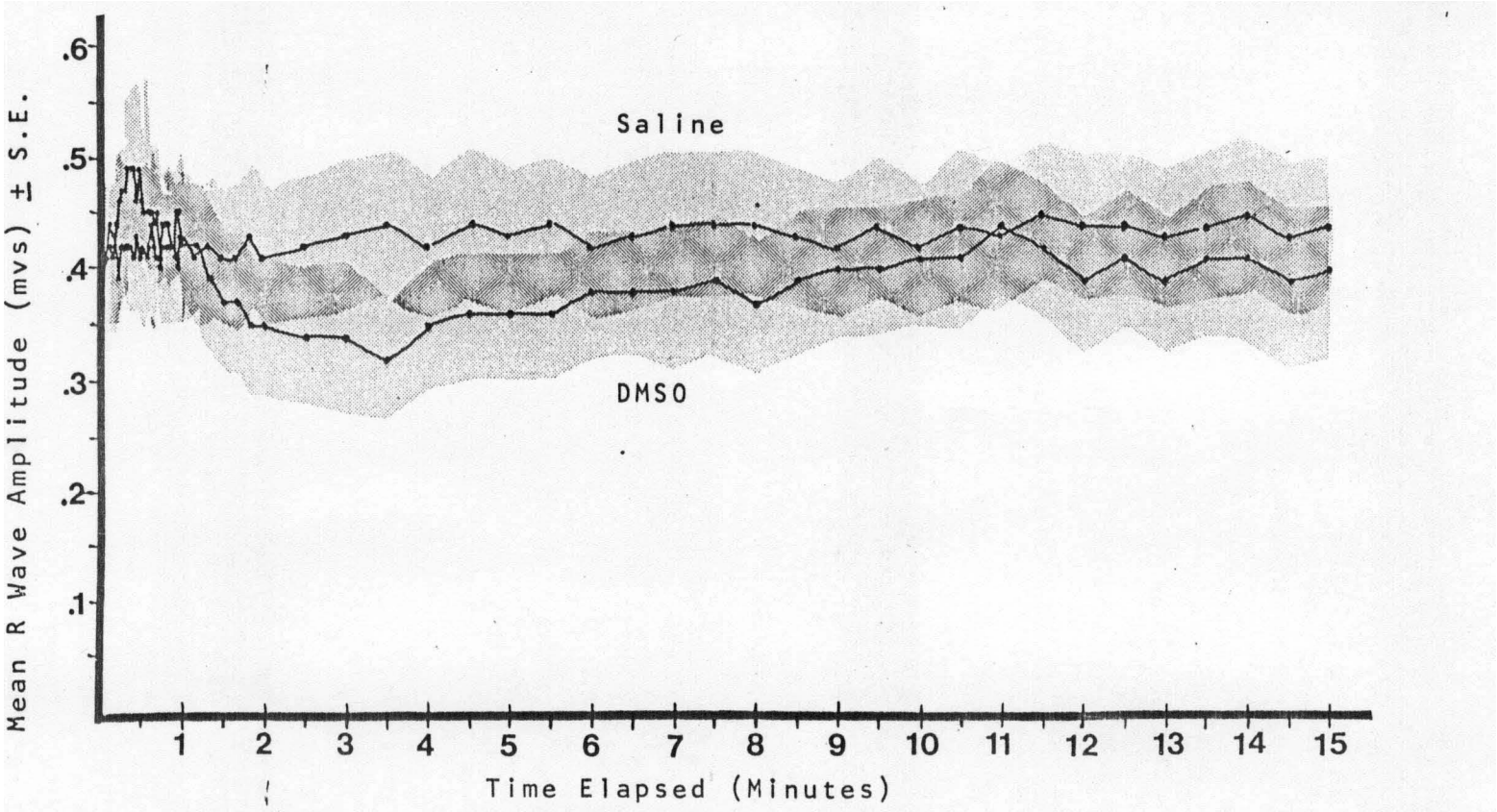


Figure 4. Graph of mean R wave amplitude (mvs) + S.E. (shaded area) against time (minutes) after injection of saline (control) or DMSO (experimental).

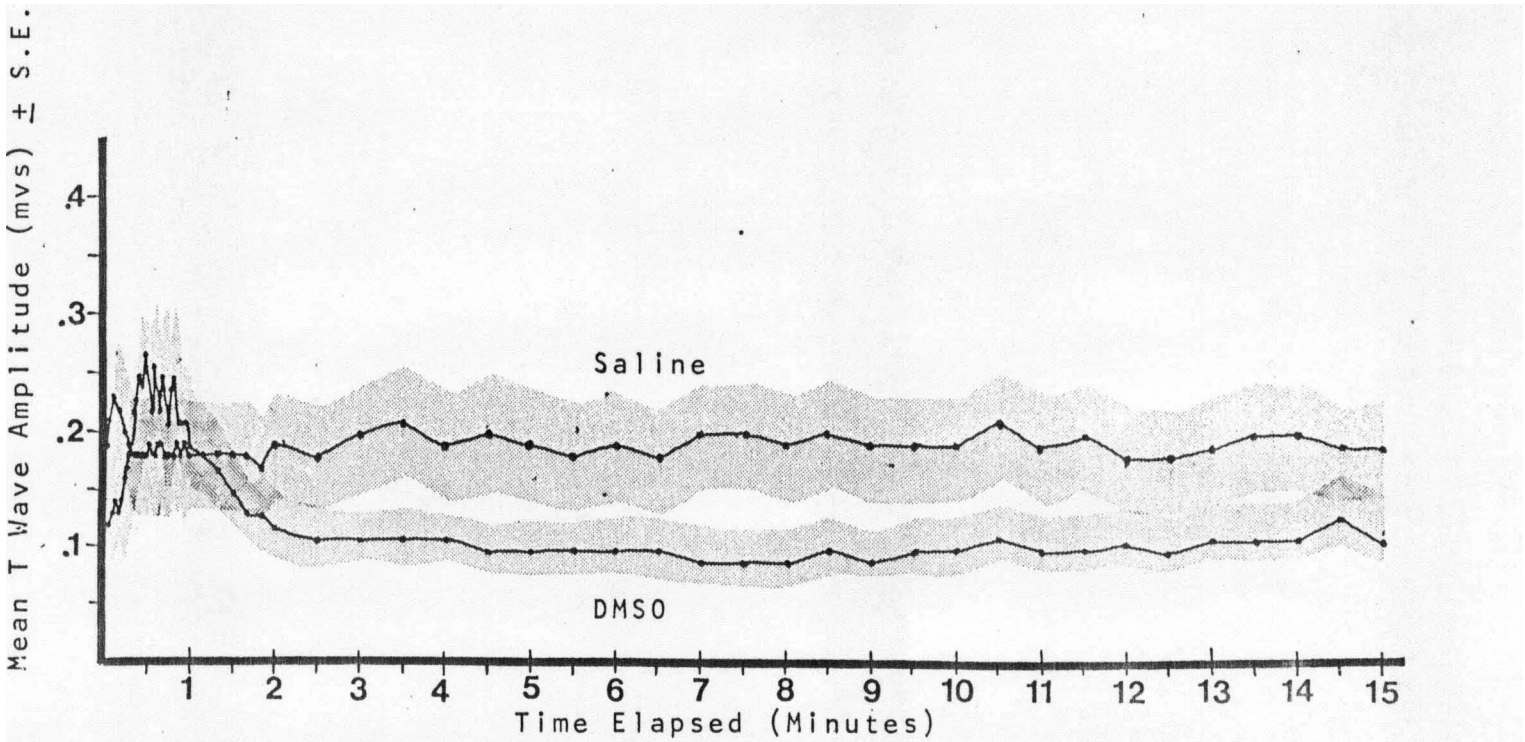


Figure 5. Graph of mean T wave amplitude (mvs) + S.E. (shaded area) against time (minutes) after injection of saline (control) or DMSO (experimental).

TABLE 6.--T-Test for Paired Comparisons: DP
DPO=DP at Time 0, DPA=Minimum DP, DPB=DP at 15 Minutes

BLOCK	CONTROL DPO	- DPA	= X_1	TREATMENT DPO	- DPA	= X_2	D X_2-X_1
1	85	70	15	65	27	38	23
2	66	66	0	51	32	19	19
3	145	137	8	50	21	29	21
4	65	60	5	35	18	17	12
5	47	45	2	65	27	38	36
6	55	50	5	43	35	8	3
7	44	39	5	42	26	16	11
8	56	54	2	35	17	18	16
9	82	68	14	77	68	9	-5
10	50	45	5	74	39	35	30
11	65	65	0	60	44	16	16
12	100	78	22	50	37	13	-9
13	40	30	10	80	34	46	36
14	50	50	0	100	20	80	80
15	46	41	5	61	30	31	26
16	84	83	1	55	15	40	39

t=4.258** (P<0.001)

BLOCK	DPO	- DPB	= X_1	DPO	- DPB	= X_2	D
1	85	85	0	65	99	-34	-34
2	66	66	0	51	57	-6	-6
3	145	140	5	50	70	-20	-15
4	65	65	0	35	50	-15	-15
5	47	51	-4	65	80	-15	-11
6	55	58	-3	43	55	-12	-9
7	44	45	-1	42	50	-8	-7
8	56	56	0	35	82	-47	-47
9	82	68	14	77	83	-6	-20
10	50	46	4	74	89	-15	-19
11	65	70	-5	60	45	15	20
12	100	78	22	50	70	-20	-42
13	40	30	10	80	80	0	-10
14	50	70	-20	100	75	25	45
15	46	44	2	61	69	-8	-10
16	84	86	-2	55	92	-37	-35

t=2.390* (0.02<P<0.05)

*Significant
**Highly significant

TABLE 7. --T-Test for Paired. Comparisons: SP
SPO=SP at Time 0, SPA=Minimum SP, SPB=SP at 15 Minutes

BLOCK	CONTROL SPO	- SPA	= X_1	TREATMENT SPO	- SPA	= X_2	D X_2-X_1
1	120	106	14	122	55	67	53
2	90	89	1	97	73	24	23
3	181	171	10	95	36	59	49
4	98	94	4	61	30	31	27
5	76	74	2	94	45	49	47
6	92	87	5	83	69	14	9
7	115	108	7	75	38	37	30
8	91	88	3	57	25	32	29
9	109	98	11	138	126	12	1
10	89	85	4	100	64	36	32
11	90	90	0	100	79	21	21
12	175	132	43	90	69	21	-22
13	87	65	22	116	50	66	44
14	85	84	1	142	45	97	96
15	76	74	2	93	49	44	42
16	146	143	3	79	22	57	54

t=4.666** (p<0.001)

BLOCK	SPO	- SPB	= X_1	SPO	- SPB	= X_2	D
1	120	118	2	122	166	-44	-46
2	90	89	1	97	121	-24	-25
3	181	177	4	95	115	-20	-24
4	98	99	-1	61	76	-15	-16
5	76	85	-9	94	110	-16	-25
6	92	95	-3	83	103	-20	-17
7	115	120	-5	75	90	-15	-10
8	91	96	-5	57	110	-53	-48
9	109	98	11	138	144	-6	-17
10	89	86	3	100	119	-19	-22
11	90	94	-4	100	87	13	17
12	175	135	40	90	108	-18	-58
13	87	66	21	116	115	1	-20
14	85	106	-21	142	116	26	47
15	76	75	1	93	105	-12	-13
16	146	150	-4	79	111	-32	-28

t=3.102** (0.05<P<0.01)

**Highly significant

TABLE 8.--T-Test for Paired Comparisons: PP
PPO=PPat Time 0, PPA=Minimum PP, PPB=PP at 15 Minutes

BLOCK	CONTROL PPO	- PPA	= X_1	TREATMENT PPO	- PPA	= X_2	D X_2-X_1
1	35	27	8	57	25	32	24
2	24	20	4	46	40	6	2
3	36	34	2	45	15	30	28
4	33	30	3	26	11	15	12
5	29	28	1	29	13	16	15
6	37	32	5	40	34	6	1
7	71	68	3	33	11	22	19
8	35	31	4	22	8	14	10
9	27	22	5	61	46	15	10
10	39	39	0	26	23	3	3
11	25	22	3	40	35	5	2
12	75	53	22	40	32	8	-14
13	47	35	12	36	16	20	8
14	35	31	4	42	25	17	13
15	30	29	1	32	16	16	15
16	62	57	5	24	5	19	14

t=4.026** (0.001<P<0.02)

BLOCK	PPO	- PPB	= X_1	PPO	- PPB	= X_2	D
1	35	33	2	57	67	-10	-12
2	24	23	1	46	64	-18	-17
3	36	37	-1	45	45	0	1
4	33	34	-1	26	26	0	1
5	29	34	-5	29	30	-1	4
6	37	37	0	40	48	-8	-8
7	71	75	-4	33	40	-7	-3
8	35	40	-5	22	28	-6	-1
9	27	30	-3	61	61	0	3
10	39	40	-1	26	30	-4	-3
11	25	24	1	40	42	-2	-3
12	75	57	18	40	38	2	-16
13	47	36	11	36	35	1	-10
14	35	36	-1	42	37	5	6
15	30	31	-1	32	36	-4	-3
16	62	64	-2	24	19	5	7

t=1.826 (0.05<P<0.10)

**Highly significant

TABLE 9.--T-Test for Paired Comparisons: MAP
MAPO=MAP at Time 0, MAPA=Minimum MAP, MAPB=MAP at 15 minutes

BLOCK	CONTROL MAPO	- MAPA =	X_1	TREATMENT MAPO	- MAPA =	X_2	D X_2-X_1
1	96.7	82.0	14.7	84.0	37.0	47.0	32.3
2	74.0	73.7	0.3	66.3	45.7	20.6	20.3
3	157.0	148.3	8.7	65.0	26.0	39.0	30.3
4	76.0	71.3	4.7	43.7	22.0	21.7	17.0
5	56.7	54.7	2.0	74.7	33.0	41.7	39.7
6	67.3	62.3	5.0	56.3	46.3	10.0	5.0
7	67.7	62.0	5.7	53.0	30.0	23.0	17.3
8	67.7	66.3	1.4	42.3	19.7	22.6	21.2
9	91.0	78.0	13.0	97.3	87.3	10.0	-3.0
10	63.0	58.3	4.7	82.7	47.3	35.4	30.7
11	73.3	73.3	0.0	73.3	55.7	17.6	17.6
12	125.0	96.7	28.3	63.3	47.7	15.6	-12.7
13	55.7	41.7	14.0	92.0	3 9 3	52.7	38.7
14	61.7	6	0.4	114.0	28.3	85.7	85.3
15	56.0	52.0	4.0	71.7	36.3	35.4	31.4
16	104.7	103.0	1.7	63.0	17.3	45.7	44.0

t=4.684** (P<0.001)

BLOCK	MAPO	- MAPB =	X_1	MAPO	- MAPB =	X_2	D
1	96.7	96.0	0.7	84.0	121.3	-37.3	-36.6
2	74.0	73.7	0.3	66.3	78.3	-12.0	-12.3
3	157.0	152.3	4.7	65.0	85.0	-20.0	-24.7
4	76.0	76.3	-0.3	43.7	58.7	-15.0	+14.7
5	56.7	62.3	-5.6	74.7	90.0	-15.3	-9.7
6	67.3	70.3	-3.0	56.3	71.0	-14.7	-11.7
7	67.7	70.0	-2.3	53.0	63.3	-10.3	-8.0
8	67.7	69.3	-1.6	42.3	91.3	-49.0	-47.4
9	91.0	78.0	13.0	97.3	103.3	-6.0	-19.0
10	63.0	59.3	3.7	82.7	99.0	-16.3	-20.0
11	73.3	78.0	-4.7	73.3	59.0	14.3	19.0
12	125.0	97.0	28.0	63.3	82.7	-19.4	-47.4
13	55.7	42.0	13.7	92.0	91.7	0.3	-13.4
14	61.7	82.0	-20.3	114.0	87.8	26.2	46.5
15	56.0	54.3	1.7	71.7	81.0	-9.3	-11.0
16	104.7	107.3	-2.6	63.0	98.3	-35.3	-32.7

t=2.626* (0.01<P<0.02)

"Significant
**Highly Significant

TABLE 10. – – T– Testfor Paired. Comparisons: CVP
CVPO=CVP at Time O, CVPA=Maximum CVP, CVPB=CVP at 15 Minutes

BLOCK	CONTROL CVPO	CVPA	X_1	TREATMENT CVPO	CVPA	X_2	D X_2-X_1
1	0.4	0.9	-0.5	1.5	7.5	-6.0	-5.5
2	0.7	1.5	-0.8	1.0	6.0	-5.0	-4.2
3	0.7	1.7	-1.0	5.7	10.5	-4.8	-3.8
4	2.0	3.2	-1.2	1.7	4.0	-2.3	-1.1
5	0.8	2.0	-1.2	0.7	8.7	-8.0	-6.8
6	0.2	1.2	-1.0	1.2	6.5	-5.3	-4.3
7	1.4	2.5	-1.1	2.0	6.2	-4.2	-3.1
8	1.5	2.2	-0.7	1.0	4.7	-3.7	-3.0
9	-0.2	0.0	-0.2	-0.5	4.7	-5.2	-5.0
10	0.0	1.5	-1.5	1.7	6.5	-4.8	-3.3
11	1.7	2.9	-1.2	2.5	5.2	-2.7	-1.5
12	0.7	2.0	-1.3	1.5	5.0	-3.5	-2.2
13	0.0	0.5	-0.5	4.9	9.4	-4.5	-4.0
14	0.7	1.7	-1.0	-1.9	5.2	-7.1	-6.1
15	2.7	3.8	-1.1	2.0	6.9	-4.9	-3.8
16	1.7	2.7	-1.0	-0.9	6.7	-7.6	-6.6

t=9.532** (P<0.001)

BLOCK	CVPO	CVPB	X_1	CVPO	CVPB	X_2	D
1	0.4	-1.6	2.0	1.5	4.0	-2.5	-4.5
2	0.7	1.0	-0.3	1.0	2.7	-1.7	-1.4
3	0.7	1.7	-1.0	5.7	6.5	-0.8	0.2
4	2.0	0.5	1.5	1.7	2.2	-0.5	-2.0
5	0.8	0.0	0.8	0.7	1.7	-1.0	-1.8
6	0.2	-0.5	0.7	1.2	3.9	-2.7	-3.4
7	1.4	1.2	0.2	2.0	2.1	-0.1	-0.3
8	1.5	0.1	1.4	1.0	1.5	-0.5	-1.9
9	-0.2	-1.0	0.8	-0.5	3.7	-4.2	-5.0
10	0.0	0.2	-0.2	1.7	2.0	-0.3	-0.1
11	1.7	-0.5	2.2	2.5	4.2	-1.7	-3.9
12	0.7	0.9	-0.2	1.5	4.2	-2.7	-2.5
13	0.0	0.0	2.0	4.9	5.2	-0.3	-0.3
14	0.7	0.7	0.0	-1.9	5.0	-6.9	-2.0
15	2.7	2.9	-0.2	2.0	4.2	-2.2	-2.0
16	1.7	2.2	-0.5	-0.9	1.0	-1.9	-1.4

t=4.714** (P<0.001)

**Highly significant

TABLE 11.--T-Test for Paired Comparisons: HR
HRO=HR at Time 0, HRA=Minimum HR, HRB=HR at 15 Minutes

BLOCK	CONTROL HRO	- HRA	= X_1	TREATMENT HRO	- HRA	= X_2	D X_2-X_1
1	166.7	148.1	18.6	75.0	61.5	13.5	-5.1
2	150.0	141.2	8.8	165.5	121.2	44.3	35.5
3	150.0	150.0	0.0	145.4	98.0	47.4	47.4
4	120.0	100.0	20.0	117.1	106.7	10.4	-9.6
5	123.1	111.6	11.5	171.4	145.4	26.0	14.5
6	120.0	117.1	2.9	133.3	106.7	26.6	23.7
7	150.0	150.0	0.0	141.2	120.0	21.2	21.2
8	171.4	154.8	6.6	154.8	120.0	34.8	18.2
9	129.8	120.0	9.8	200.0	177.8	22.2	12.4
10	165.5	160.0	5.5	133.3	120.0	13.3	7.8
11	133.3	117.1	16.2	150.0	150.0	0.0	-16.2
12	200.0	200.0	0.0	133.3	126.3	7.0	7.0
13	129.7	121.2	8.5	192.0	171.4	20.6	12.1
14	120.0	117.1	2.9	160.0	51.1	108.9	106.0
15	154.8	150.0	4.8	133.3	104.3	29.0	24.2
16	165.5	160.0	5.5	133.3	72.7	60.6	55.1

t=3.023** (0.005<P<0.01)

BLOCK	HRO	- HRB	= X_1	HRO	- HRB	= X_2	D
1	166.7	153.8	12.9	75.0	69.6	5.4	-7.5
2	150.0	145.4	4.6	165.5	165.5	0.0	-4.6
3	150.0	150.0	0.0	145.4	133.3	12.2	12.2
4	120.0	100.0	20.0	117.1	109.1	8.0	-12.0
5	123.1	111.6	11.5	171.4	150.0	21.4	9.9
6	120.0	120.0	0.0	133.3	137.1	-3.8	-3.8
7	150.0	154.8	-4.8	141.2	126.3	14.9	19.7
8	174.1	154.8	19.3	154.8	133.3	21.5	2.2
9	129.8	123.1	6.7	200.0	184.6	15.4	8.7
10	165.5	160.0	5.5	133.3	120.0	13.3	7.8
11	133.3	117.1	16.2	150.0	150.0	0.0	-16.2
12	200.0	200.0	0.0	133.3	129.7	3.6	3.6
13	129.7	123.1	6.6	192.0	171.4	20.6	14.0
14	120.0	120.0	0.0	160.0	126.3	33.7	33.7
15	154.8	150.0	4.8	133.3	109.1	24.2	19.4
16	165.5	171.4	-5.9	133.3	145.4	-12.1	-6.2

t=1.529 (0.10<P<0.20)

**Highly significant

TABLE 12.--T-Test for Paired Comparisons: R Magnitude
RO=R at Time 0, RA=Maximum R, RB=R at 15 Minutes

BLOCK	CONTROL RO	− RA	= X_1	TREATMENT RO	− RA	= X_2	D X_2-X_1
1	0.40	0.40	0.00	0.16	0.43	−0.27	−0.27
2	0.19	0.28	−0.09	0.57	0.92	−0.35	−0.26
3	0.52	0.61	−0.09	0.63	1.25	−0.62	−0.53
4	0.13	0.19	−0.06	0.54	0.06	−0.06	0.00
5	0.73	0.92	−0.19	0.28	0.43	−0.15	0.04
6	0.25	0.32	−0.07	0.49	0.51	−0.02	0.05
7	0.75	0.80	−0.05	0.56	0.66	−0.10	−0.05
8	0.64	0.91	−0.27	0.03	0.42	−0.39	−0.12
9	0.24	0.26	−0.01	0.36	0.66	−0.30	−0.29
10	0.85	0.91	−0.06	0.37	0.65	−0.28	−0.22
11	0.30	0.33	−0.03	0.63	0.76	−0.13	−0.10
12	0.14	0.16	−0.02	0.41	0.56	−0.15	−0.13
13	0.42	0.43	−0.01	0.10	0.19	−0.09	−0.08
14	0.12	0.26	−0.14	0.06	0.11	−0.05	0.09
15	0.29	0.33	−0.04	1.05	1.06	−0.01	0.03
16	0.61	0.63	−0.02	0.25	0.31	−0.06	−0.04

t=2.886* (0.01<P<0.02)

BLOCK	RO	− RB	= X_1	RO	− RB	= X_2	D
1	0.40	0.31	0.09	0.16	0.18	−0.02	−0.11
2	0.19	0.26	−0.07	0.57	0.47	0.10	0.17
3	0.52	0.47	0.05	0.63	0.67	−0.04	−0.09
4	0.13	0.19	−0.06	0.54	0.51	0.03	0.09
5	0.73	0.92	−0.19	0.28	0.43	−0.15	0.04
6	0.25	0.27	−0.02	0.49	0.49	0.00	0.02
7	0.75	0.65	0.10	0.56	0.56	0.00	−0.10
8	0.64	0.86	−0.22	0.03	0.07	−0.04	0.18
9	0.24	0.26	−0.02	0.36	0.33	0.03	0.05
10	0.85	0.85	0.00	0.37	0.40	−0.03	−0.03
11	0.30	0.31	−0.01	0.63	0.42	0.21	0.22
12	0.14	0.12	0.02	0.41	0.40	0.01	−0.01
13	0.42	0.43	−0.01	0.10	0.19	−0.09	−0.08
14	0.12	0.15	−0.03	0.06	0.05	0.01	0.04
15	0.29	0.33	−0.04	1.05	0.98	0.07	0.11
16	0.61	0.60	0.01	0.25	0.22	0.03	0.02

t=1.269 (0.20<P<0.50)

*Significant

Mean Arterial Pressure

The mean DMSO-treatment MAP, after a short initial rise (Figure 1) of approximately 6 seconds after the beginning of injection, plummeted until it reached a mean minimum at 30.3 seconds. The difference in MAP between treated and control animals was highly significant ($P<0.001$). From this minimum value the MAP gradually increased. After approximately 3 1/2 minutes it regained the original MAP value recorded at time 0, and, continued to rise until it reached a maximum at approximately 9 minutes. At the end of the experiment the MAP was still significantly different from the control ($0.01<P<0.02$). The control MAP remained fairly constant throughout the 15 minutes except for a brief increase of approximately 10 seconds immediately after the beginning of the saline injection.

Central Venous Pressure

Figure 2 illustrates the mean (±S.E.) CVP values for both control and treatment animals. After DMSO injection, the CVP rose rapidly, reached a mean maximum at 1 minute 40 seconds, then slowly declined, although still remaining far above the initial value by the end of the experiments. Differences in CVP for treatment and control animals were highly significant ($P<0.001$)

at both t_a and t_b. The control CVP demonstrated, a short initial rise, then remained near the time 0 value for the remainder of the experiment.

Heart Rate

The mean HR (±S.E.) is plotted in Figure 3. The control and treatment values were initially very similar. The control remained basically constant, with a slight decrease towards the end of the experiment, HR of DMSO-treated animals, however, quickly dropped to a mean minimum at 28 seconds, a value significant in its difference from the control. The rate then slowly increased until, at the end of the experiment, there was no longer any significant difference between the control and experimental values at the 5% level.

R Wave Magnitude

The control and DMSO R values were also initially similar, as seen in Figure 4 and Table 4. The control increased slightly towards the end of the 15 minutes, but DMSO R values were significantly elevated ($0.01 < P < 0.02$) over the control during the initial 30 seconds. The amplitude of the R wave then gradually decreased, reaching a minimum at 2 minutes 30 seconds. By the end of the experiment, there was no longer a significant difference at the 5% level between the control and DMSO R values,

T Wave Magnitude

Figure 5 illustrates the T wave pattern over the course of the experiments. Since the T deflection could normally be either positive or negative, the absolute value of T was plotted and used for calculations. The control T exhibited. an initial rapid increase during the first 8 seconds, then returned. to near initial values for the remainder of the time. The DMSO T values became significantly elevated. ($0.01<P<0.02$) soon after injection; the graph peaks at 28 seconds. The T amplitude then dropped. below the initial recording at time 0, but by the end, of the experiments, on the average, there was no longer any significant difference ($P>0.05$) between the control and experimental values.

Thirteen of the 16 control T wave recordings were positive and 3 were negative. The direction of the deflection remained the same throughout the experiment. For the DMSO trials, hoaever, only six experiments were consistantly positive and. four consistantly negative. Of these, two had. S–T segment elevations beginning approximately 10 seconds after injection of DMSO began. A third demonstrated, a depressed. S–T segment at the 10 second. time nhich became quite marked. by 28 seconds. By six minutes, the S–T segment had returned to normal. The remaining six DMSO trials demonstrated reversals in the

direction of the T wave deflection and snitched betaeen monophasic and diphasic waves. These reversals occured several times in the course of each experiment, usually beginning 10 to 30 seconds after the initiation of the DMSO injection.

Pearson Correlation

Data from the DMSO-treatment MAP trials were subjected to a simple linear correlation analysis (Pearson Correlation Coefficient). These data, the correlation coefficients, and two-tailed probability values are presented in Table 14. The means and standard de-viathons of the variables examined were also evaluated:

$MAP(X_1)$=32.7 (±19.549) mmHg

$MAP(X_2)$=13.7 (±18.292) mmHg

Time A=30.3 (±11.287) seconds

Volume injected=3.5 (±0.905) ml

Injection time=11.7 (±6.722) seconds

Weight=3.45 (±0.901) kgs

The $MAP(X_1)$ is the difference between the time 0 and minimum MAPs, and the $MAP(X_2)$ is the difference between time 0 MAP and, the MAP at 15 minutes. Time A is the time necessary to attain the minimum MAP value after injection begins.

A significant correlation ($P<0.05$) was found between the minimum MAP and the volume of DMSO injected,

as well as with the weight of the animal. The time to attain minimum MAP was significantly correlated with the injection time and the value of $MAP(X_1)$, and the relationship to weight was highly significant ($P<0.01$). No significant correlation existed between $MAP(X_1)$ and the injection time, nor between $MAP(X_2)$ and any of the variables tested..

TABLE 14.--Pearson Correlation N=16
$MAP(X_1)$=MAP at Time 0 - Minimum MAP
$MAP(X_2)$=MAP at Time 0 - MAP at 15 Minutes
Time A=Time to Reach Minimum MAP

$MAP(X_1)$	VOLUME INJECTED	WEIGHT	INJECTION TIME	$MAP(X_2)$
COEFFICIENT	0.5841	0.5881	0.2122	-0.2922
SIGNIFICANCE	0.018*	0.017*	0.430	0.272

$MAP(X_2)$	VOLUME INJECTED	WEIGHT	INJECTION TIME	$MAP(X_1)$
COEFFICIENT	-0.1182	-0.1053	-0.1107	-0.2922
SIGNIFICANCE	0.663	0.698	0.683	0.272

TIME A	INJECTION TIME	WEIGHT	$MAP(X_1)$	$MAP(X_2)$
COEFFICIENT	0.5410	0.6494	0.5525	0.2523
SIGNIFICANCE	0.029*	0.006**	0.026*	0.346

*Significant
**Highly significant

DISCUSSION

From the results, dramatic effects on the cardiovascular system are evident after injection of DMSO. Hoaever, the mechanisms behind these results are not always clear.

The transient increase in MAP during the first few seconds of the experiments is most likely simply the response to the blood volume change as the injection is introduced.. The increase is evident in both the experimental and. the control trials.

After this initial increase, the MAP elicits a diphasic response in the DMSO experiments. Falling quickly during the first 30 seconds, it then gradually increases and is significantly elevated by the end of the experiment. Only two sources are responsible for a change in MAP: (1) the volume of blood. distending the arteries, or cardiac output (C.O.), and. (2) the resistance offered by the peripheral circulatory system, or total peripheral resistance (TPR). Increasing either value will increase the MAP.

The C.O., in turn, is determined by HR and SV: (C.O.=HR x SV). Evidence for a change in HR is available directly from the ECG tracings, and the change corresponds very closely with the fluctuations in MAP during the first few minutes of the experiments. The MAP and HR simultaneously decrease, then gradually increase, Hoaever, the HR does

not follow the eventual elevation seen in the MAP, but remains near normal values. What is causing the changes in HR?

Evidence for a direct effect on the heart by DMSO is gathered by interpretation of the ECG tracings. The R and T waves become elevated during the first minute, then return to near normal values. This response is perhaps reflective of electrophysiological or permeability changes within the cells of the heart itself. According to Bolton (1975), bradycardia and T wave amplification occur with hyperkalemia. Although its effects are not well established, hypercalcemia is also believed to result in increased T wave magnitude, as sell as S-T segment elevation. David et al. (1982) found that persistent increases in the R wave amplitude occurred in association aith a marked delay in intramyocardial conduction. According to Hill and Gettes (1980), higher interstitial potassium concentrations could cause this delay.

Myocardial hypoxia is also a possible cause of the ECG fluctuations. It may be signalled by changes in the magnitude or direction of deflection of the T wave, and. S-T segment elevation or depression. All of these phenomena were noted in various DMSO trials, but never in the controls. The hypoxia may be due to a decreased respiratory rate or perhaps a decreased blood supply to the

heart. due to the decreased MAP. DiStefano (1965) noted apnea in his experiments with cats, and reported artificial respiration was often needed after the DMSO injection. That extreme was never needed in this research, however a depressed respiratory rate was occasionally noted immediately after the injection.

Stroke volume increases if there is an increase in the fiber length of the cardiac muscle (Starling's Law of the Heart), as would occur with increased ventricular filling. The CVP was measured at the entrance of the right atrium, and its increased pressure could be reflective of increased venous return. In obeiance to Starling's Lac, as more blood fills the ventricles a greater force of contraction results and, consequently, a greater volume of blood is ejected. The stroke volume increase could also be augmented by the decreased HR, which permits more time for ventricular filling.

In addition, Shlafer (1975) theorized that osmotic stress imposed on the myocardial cell could produce positive inotropy. He suggested that the cell undergoes dehydration upon exposure to DMSO, which would tend to raise the apparent intracellular concentration of free solutes, most notably Ca^{++}. This Ca^{++} is then available to activate the myofibrils and, therefore, increase the force of contraction.

The increased venous return could result from an increased plasma volume. Klingman (1965) presented evidence that topically applied DMSO causes histamine release, resulting in peripheral vasodilation and increased vascular leakage. When the MAP decreases, the filtration pressure in the capillaries also decreases, and fluid could floe into the circulatory system from surrounding tissues, The central nervous system could also be affecting the venous return. When the MAP decreases, baroreceptors detect the pressure difference and the sympathetic nervous system is strongly stimulated within a few seconds. The effects of this stimulation are manifested by (1) increased tone of most of the blood vessels in the circulatory system, especially the veins, and (2) stimulation of the heart to increase the force of contraction. There is therefore an increased tendency for blood to flow back to the heart, further increasing the CVP.

Another mechanism affecting the MAP is the TPR. This variable was not directly measured, and is influenced primarily by the diameter of the arterioles. Vasoconstriction may be occuring, further increasing the MAP and counteracting the vasodilating effect of the histamine, but this is unknonn.

The results of the Pearson Correlation analyses are not always explicable from the data obtained in this

research, nor aere the relationships tested even mentioned in the available literature. Why, for example, does the magnitude of the maximum MAP response increase with an increase in the weight of the animal and the amount of DMSO injected, if the dosage was kept constant? One possible explanation is the fact that larger animals tend to have a lower metabolic rate, thus they would tend to break down the drug at a reduced rate and more would be available for a longer period of time to affect the body.

It is logical, however, that the time to reach this maximum response increases as the weight of the animal increases because it usually took longer to inject the larger volume of drug. But why is there also a significant correlation between the time to reach the maximum effect and the magnitude of the effect?

Further research is necessary to answer these questions. Determining more specifically the role of the central nervous system in relation to its effect on the heart, blood vessel constriction and respiration after DMSO administration would provide valuable information, as would further investigation of the nature of cell permeability changes.

In summary, DMSO administration exhibits rather remarkable effects on just about every parameter of the cardiovascular system, not all of which are easily explained. Possibly because of a direct effect on the

cells of the heart itself, DMSO causes the classic symptoms of acute heart failure: a reduced heart rate and concomitant drop in MAP. As the body compensates with increased SV and a gradually increasing HR, the MAP returns to normal, then becomes significantly elevated, possibly due to positive inotropy. This research answered a few questions and raised many more. The known factors as well as the unknown possibilities should be taken into consideration before clinical administration of the drug.

APPENDIX

Control and DMSO-Treatment Data

The appendix lists the data obtained from control (#1-#16) and DMSO-treatment (#17-#32) animals. The sex, weight, total injection time (beginning at time 0), and the volume injected are given for each trial. Time (minutes:seconds), diastolic, systolic, pulse, mean arterial and central venous pressures (mmHg), HR (bpm), R and T wave magnitudes (mvs) are recorded for each of 63 time periods per trial over a 15 minute interval.

APPENDIX

Control Data

1. Female Weight=5.03 kg Injection Time=20.0 secs
Amount Injected=5.0 ml

TIME-	DP	SP	PP	MAP	CVP	HR	R	T
00:00	85	120	35	96.7	0.4	166.7	0.40	0.69
00:02	85	120	35	96.7	0.4	166.7	0.37	0.69
00:04	85	120	35	96.7	0.6	166.7	0.37	0.69
00:06	85	122	37	97.3	0.7	166.7	0.33	0.69
00:08	86	123	37	98.3	0.7	166.7	0.36	0.70
00: 10	86	123	37	98.3	0.7	166.7	0.39	0.69
00: 12	85	122	37	97.3	0.7	166.7	0.36	0.69
00: 14	85	121	36	97.0	0.7	166.7	0.39	0.69
00: 16	85	122	37	97.3	0.7	166.7	0.36	0.67
00: 18	85	121	36	97.0	0.7	166.7	0.37	0.67
00: 20	86	124	38	98.7	0.9	166.7	0.37	0.66
00: 22	85	122	37	97.3	0.9	166.7	0.34	0.64
00: 24	85	123	38	97.7	0.9	166.7	0.34	0.67
00:26	85	121	36	97.0	0.7	163.4	0.39	0.63
00:28	85	121	36	97.0	0.7	166.7	0.39	0.66
00:30	85	122	37	97.3	0.9	173.9	0.34	0.64
00:32	85	122	37	97.3	0.7	166.7	0.37	0.66
00:34	85	122	37	97.3	0.6	166.7	0.34	0.64
00:36	86	125	39	99.0	0.7	166.7	0.37	0.66
00:38	85	124	39	99.0	0.4	166.7	0.34	0.64
00:40	86	125	39	99.0	0.7	166.7	0.39	0.67
00:42	86	125	39	99.0	0.1	166.7	0.34	0.63
00:44	87	126	39	100.0	0.4	173.9	0.36	0.66
00:46	86	125	39	99.0	0.1	173.9	0.36	0.63
00:48	88	126	38	100.7	0.6	166.7	0.39	0.64
00:50	87	125	38	99.7	0.4	162.6	0.34	0.63
00: 52	87	126	39	100.0	0.6	166.7	0.39	0.66
00:54	87	125	38	99.7	0.1	166.7	0.34	0.63
00:56	88	126	38	100.7	0.7	166.7	0.36	0.66
00:58	88	125	37	100.3	0.3	166.7	0.33	0.63
01:00	90	127	37	102.3	0.6	166.7	0.36	0.66
01:10	88	126	38	100.7	0.3	173.9	0.31	0.64
01:20	90	128	38	102.7	0.7	173.9	0.36	0.66
01:30	90	127	37	102.3	0 a 4	173.9	0.31	0.66
01:40	88	123	35	99.7	0.4	173.9	0.30	0.61
01:50	91	127	36	103.0	0.2	166.7	0.33	0.63
02:00	90	129	39	103.0	0.0	170.9	0.30	0.64
02:30	90	130	40	103.3	-0.3	178.6	0.30	0.61
03:00	90	132	42	104.0	-0.3	178.6	0.31	0.61
03:30	93	133	40	106.3	-0.6	178.6	0.28	0.61

APPENDIX (Continued)

	TIME	DP	SP	PP	MAP	CVP	HR	R	T
1.	04:00	90	132	42	104.0	-0.4	166.7	0.28	0.61
	04:30	81	123	42	95.0	0.6	173.9	0.33	0.67
	05:00	77	115	38	89.7	-0.6	166.7	0.31	0.64
	05:30	77	113	36	89.0	-0.4	160.0	0.30	0.61
	06:00	75	110	35	86.7	0.3	153.8	0.33	0.60
	06:30	73	108	35	84.7	-0.3	148.1	0.36	0.63
	07:00	70	108	38	82.7	0.0	148.1	0.37	0.66
	07:30	70	106	36	82.0	0.0	148.1	0.36	0.66
	08:00	74	109	35	85.7	-0.3	148.1	0.36	0.64
	08:30	77	112	35	88.7	-0.7	148.1	0.36	0.61
	09:00	82	115	33	93.0	-0.9	148.1	0.34	0.60
	09:30	82	116	34	93.3	-0.6	148.1	0.33	0.58
	10:00	82	116	34	93.3	-1.2	153.8	0.34	0.63
	10:30	80	115	35	91.7	-1.5	153.8	0.34	0.63
	11:00	83	110	27	92.0	-0.9	153.8	0.33	0.58
	11:30	85	112	27	94.0	-0.9	153.8	0.34	0.61
	12:00	80	115	35	91.7	-0.9	153.8	0.33	0.60
	12:30	82	116	34	93.3	-0.7	153.8	0.33	0.58
	13:00	82	115	33	93.0	-1.0	153.8	0.33	0.58
	13:30	81	116	35	92.7	-1.3	153.8	0.31	0.58
	14:00	82	116	34	93.3	-1.2	160.0	0.31	0.58
	14:30	85	118	33	96.0	-1.3	153.8	0.30	0.57
	15:00	85	118	33	96.0	-1.6	153.8	0.31	0.57

2. **Female** Weight=4.67 kg **Injection** Time=10.5 secs
Amount Injected=4.7 ml

00:00	66	90	24	74.0	0.7	150.0	0.19	0.02
00:02	68	93	25	76.3	0.7	150.0	0.24	0.02
00:04	68	93	25	76.3	0.8	150.0	0.19	0.02
00:06	70	94	24	78.0	1.0	150.0	0.22	0.03
00:08	68	94	26	76.6	1.2	150.0	0.16	0.03
00:10	70	95	25	78.3	1.5	150.0	0.17	0.02
00:12	69	95	26	77.7	1.0	150.0	0.22	-0.04
00:14	67	92	25	75.3	1.0	150.0	0.18	0.03
00:16	67	94	27	76.0	1.0	150.0	0.22	0.04
00:18	66	91	25	74.3	1.0	150.0	0.20	0.03
00:20	67	93	26	75.7	1.2	150.0	0.22	0.02
00:22	68	93	25	76.3	1.0	150.0	0.23	0.03
00:24	69	93	24	77.0	1.2	150.0	0.20	0.02
00:26	70	95	25	78.3	1.0	150.0	0.22	0.02
00:28	70	95	25	78.3	1.2	150.0	0.20	0.02
00:30	70	95	25	78.3	1.2	150.0	0.20	0.02
00:32	70	94	24	78.0	1.0	150.0	0.21	0.02
00:34	70	94	24	78.0	1.2	150.0	0.19	0.02
00:36	70	95	25	78.3	1.1	150.0	0.24	0.02

APPENDIX (Continued)

	TIME	DP	SP	PP	MAP	CVP	HR	R	T
2.	00:38	70	94	24	78.0	1.2	150.0	0.20	0.02
	00:40	70	95	25	78.3	1.2	150.0	0.20	0.01
	00:42	70	95	25	78.3	1.2	150.0	0.22	0.02
	00:44	70	94	24	78.0	1.1	150.0	0.20	0.02
	00:46	70	95	25	78.3	1.2	150.0	0.23	0.02
	00:48	70	94	24	78.0	1.0	150.0	0.21	0.02
	00:50	70	95	25	78.3	1.2	150.0	0.20	0.02
	00:52	70	95	25	78.3	1.0	150.0	0.24	0.02
	00:54	70	94	24	78.0	1.2	145.5	0.20	0.02
	00:56	70	95	25	78.3	1.2	150.0	0.24	0.03
	00:58	70	94	24	78.0	1.0	150.0	0.20	0.01
	01:00	70	95	25	78.3	1e2	150.0	0.23	0.02
	01:10	70	95	25	78.3	1.2	141.2	0.21	0.01
	01:20	69	93	24	77.0	1e2	145.5	0.21	0.01
	01:30	67	92	25	75.3	1.2	150.0	0.20	0.02
	01:40	69	92	23	76.7	1.0	145.4	0.20	0.02
	01:50	69	94	25	77.3	1.0	150.0	0.20	0.02
	02:00	70	94	24	78.0	1.0	150.0	0.23	0.02
	02:30	69	93	24	77.0	0.8	145.4	0.20	0.02
	03:00	69	94	25	77.3	1.0	-	-	-
	03:30	69	93	24	77.0	0.7	-	-	-
	04:00	69	93	24	77.0	0.7	145.4	0.21	0.02
	04:30	70	93	24	77.0	0.9	145.4	0.21	0.02
	05:00	69	92	23	76.7	0.7	141.2	0.24	0.02
	05:30	71	91	20	77.7	0.8	141.2	0.25	0.03
	06:00	71	91	20	77.7	1.0	145.4	0.24	0.03
	06:30	70	95	25	78.3	1.0	145.4	0.20	0.02
	07:00	70	95	25	78.3	1.0	141.2	0.22	0.02
	07:30	71	95	24	79.0	0.7	145.4	0.23	0.02
	08:00	71	95	24	79.0	0.7	145.4	0.25	0.03
	08:30	70	95	25	78.3	0.7	141.2	0.24	0.03
	09:00	71	95	24	79.0	0.7	141.2	0.22	0.02
	09:30	72	95	23	79.7	0.5	145.4	0.26	0.03
	10:00	75	97	22	82.3	0.6	145.4	0.22	0.02
	10:30	75	95	20	81.7	1.0	141.2	0.21	0.02
	11:00	73	94	21	80.0	0.7	145.4	0.23	0.02
	11:30	71	95	24	79.0	0.7	145.4	0.22	0.02
	12:00	70	92	22	77.3	0.7	141.2	0.21	0.02
	12:30	68	90	22	75.3	0.7	145.4	0.28	0.02
	13:00	66	89	23	73.7	0e5	145.4	0.25	0.02
	13:30	68	90	22	75.3	1.0	145.4	0.23	0.03
	14:00	68	90	22	75.3	1.0	-	-	-
	14:30	67	90	23	74.7	1.0	145.4	0.26	0.02
	15:00	66	89	23	73.7	1.0	145.4	0.26	0.02

3. Female Weight=3.96 kg Injection Time=19.0 secs
Amount Injected=4.0 ml

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:00	145	181	36	157.0	0.7	150.0	0.52	0.26
00:02	144	181	37	156.3	0.9	150.0	0.57	0.23
00:04	145	185	40	158.3	1.0	150.0	0.60	0.27
00:06	145	181	36	157.0	1.0	150.0	0.60	0.30
00:08	145	183	38	157.7	1.0	150.0	0.57	0.27
00:10	145	185	40	158.3	1.0	150.0	0.61	0.30
00:12	145	182	37	157.3	1.1	150.0	0.60	0.32
00:14	146	184	38	158.7	1.1	150.0	0.56	0.28
00:16	146	184	38	158.7	1.0	150.0	0.60	0.30
00:18	146	183	37	158.3	1.1	150.0	0.60	0.27
00:20	146	184	38	158.7	1.0	150.0	0.57	0.26
00:22	146	184	38	158.7	1.0	150.0	0.56	0.24
00:24	145	184	39	158.0	1.0	150.0	0.60	0.27
00:26	144	182	38	156.7	0.9	150.0	0.59	0.26
00:28	145	182	37	157.3	1.0	150.0	0.56	0.21
00:30	145	185	40	158.3	1.0	150.0	0.60	0.24
00:32	144	181	37	156.3	1.0	150.0	0.60	0.25
00:34	144	181	37	156.3	1.0	150.0	0.60	0.24
00:36	145	184	39	158.0	1.0	150.0	0.57	0.25
00:38	145	183	38	157.7	1.0	150.0	0.59	0.24
00:40	145	183	38	157.7	1.0	150.0	0.60	0.25
00:42	145	183	38	157.7	1.0	150.0	0.56	0.22
00:44	145	184	38	155.7	1.0	150.0	0.60	0.22
00:46	143	181	38	155.7	1.0	150.0	0.60	0.26
00:48	145	181	36	157.0	1.0	150.0	0.55	0.25
00:50	145	184	39	158.0	1.0	150.0	0.57	0.24
00:52	144	181	37	156.3	1.0	150.0	0.57	0.25
00:54	143	180	37	155.3	1.0	150.0	0.57	0.25
00:56	145	181	36	157.0	1.0	150.0	0.59	0.25
00:58	144	182	38	156.7	1.0	150.0	0.57	0.24
01:00	144	181	37	156.3	1.0	150.0	0.55	0.20
01:10	-	-	-	-	1.0	150.0	0.56	0.25
01:20	144	183	39	157.0	1.0	150.0	0.60	0.24
01:30	145	182	37	157.3	1.0	150.0	0.58	0.24
01:40	144	180	36	156.0	1.0	150.0	0.56	0.24
01:50	144	181	37	156.3	1.0	150.0	0.58	0.25
02:00	142	180	38	154.7	1.0	150.0	0.55	0.25
02:30	144	181	37	156.3	1.0	150.0	0.56	0.20
03:00	143	180	37	155.3	1.0	150.0	0.56	0.26
03:30	141	176	35	152.7	0.6	150.0	0.60	0.25
04:00	140	175	35	151.7	1.0	150.0	0.52	0.21
04:30	140	175	35	151.7	1.0	150.0	0.56	0.23

	TIME	DP	SP	PP	MAP	CVP	HR	R	T
3.	05:00	137	171	34	148.3	1.0	150.0	0.55	0.25
	05:30	137	171	34	148.3	1.0	150.0	0.55	0.24
	06:00	137	172	35	148.7	1.0	150.0	0.53	0.24
	06:30	137	171	34	148.3	1.0	150.0	0.55	0.24
	07:00	137	172	35	148.7	0.7	150.0	0.51	0.25
	07:30	138	174	36	150.0	0.9	150.0	0.55	0.24
	08:00	140	175	35	151.7	1.0	150.0	0.50	0.23
	08:30	139	174	35	150.7	1.0	150.0	0.52	0.25
	09:00	141	175	34	152.3	1.0	150.0	0.51	0.20
	09:30	140	175	35	151.7	1.2	150.0	0.50	0.24
	10:00	139	175	36	151.0	1.1	150.0	0.50	0.25
	10:30	141	176	35	152.7	11	150.0	0.50	0.21
	11:00	141	177	36	153.0	1.2	150.0	0.50	0.21
	11:30	140	177	37	152.3	12	150.0	0.50	0.22
	12:00	141	177	36	153.0	1.2	150.0	0.50	0.20
	12:30	140	176	36	152.0	12	150.0	0.50	0.20
	13:00	141	177	36	153.0	1.2	150.0	0.49	0.20
	13:30	141	177	36	153.0	1.2	150.0	0.51	0.20
	14:00	140	176	36	152.0	15	150.0	0.49	0.20
	14:30	141	179	38	153.7	1.2	150.0	0.51	0.20
	15:00	140	177	37	152.3	1.7	150.0	0.47	0.20
4.	Female Weight=3.46 kg Injection Time=5.5 secs Amount Injected=3.5 ml								
	00:00	65	98	33	76.0	2.0	120.0	0.13	0.02
	00:02	65	99	34	76.3	2.7	120.0	0.14	0.03
	00:04	65	100	35	76.7	3.2	120.0	0.16	0.04
	00:06	66	100	34	77.3	3.0	-	0.16	0.09
	00:08	65	100	35	76.7	2.6	-	-	-
	00:10	62	96	34	73.3	2.7	120.0	0.17	0.08
	00:12	61	96	35	72.7	2.7	120.0	0.18	0.08
	00:14	62	96	34	73.3	2.6	120.0	0.14	0.07
	00:16	64	97	33	75.0	2.5	117.1	0.16	0.05
	00:18	64	99	35	75.7	2.6	117.1	0.18	0.03
	00:20	64	99	35	75.7	2.6	120.0	0.16	0.04
	00:22	64	99	35	75.7	2.6	117.1	0.17	0.02
	00:24	64	98	34	75.3	2.5	117.1	0.17	0.02
	00:26	64	99	35	75.7	2.6	117.1	0.17	0.03
	00:28	64	99	35	75.7	2.5	117.1	0.17	0.03
	00:30	65	99	34	76.3	2.5	117.1	0.13	0.03
	00:32	64	99	35	75.7	2.5	117.1	0.17	0.02
	00:34	65	99	34	76.3	2.5	117.1	0.13	0.03
	00:36	65	99	34	76.3	2.5	117.1	0.17	0.03
	00:38	65	98	33	76.0	2.5			

APPENDIX (Continued)

	TIME	DP	SP	PP	MAP	CVP	HR	R	T
4.	00:40	65	99	34	76.3	2.2	117.1	0.17	0.02
	00:42	65	99	34	76.3	2.5	120.0	0.14	0.01
	00:44	65	99	34	76.3	2.4	120.0	0.16	0.02
	00:46	64	98	34	75.3	2.2	120.0	0.17	0.02
	00:48	64	98	34	75.3	2.2	120.0	0.14	0.02
	00:50	64	98	34	75.3	2.2	120.0	0.14	0.03
	00:52	64	98	34	75.3	2.2	120.0	0.16	0.03
	00:54	64	98	34	75.3	2.2	120.0	0.17	0.03
	00:56	64	98	34	75.3	2.1	114.3	0.16	0.03
	00:58	64	98	34	75.3	2.1	120.0	0.17	0.03
	01:00	64	97	33	75.0	2.2	120.0	0.17	0.01
	01:10	64	99	35	75.7	2.5	120.0	0.14	0.02
	01:20	64	97	33	75.0	2.5	120.0	0.14	0.04
	01:30	63	97	34	74.3	2.5	120.0	0.13	0.02
	01:40	63	97	34	74.3	2.2	117.1	0.14	0.02
	01:50	62	96	34	73.3	2.2	114.3	0.16	0.03
	02:00	63	97	34	74.3	2.2	117.1	0.14	0.04
	02:30	61	95	34	72.3	2.0	114.3	0.16	0.03
	03:00	61	95	34	72.3	2.0	114.3	0.14	0.03
	03:30	61	95	34	72.3	2.0	114.3	0.14	0.04
	04:00	61	95	34	72.3	1.7	114.3	0.13	0.05
	04:30	61	95	34	72.3	1.7	109.1	0.17	0.04
	05:00	61	95	34	72.3	1.5	109.1	0.16	0.04
	05:30	61	95	34	72.3	1.5	109.1	0.16	0.05
	06:00	60	94	34	71.3	1.6	111.6	0.14	0.05
	06:30	60	94	34	71.3	1.2	109.1	0.16	0.07
	07:00	60	94	34	71.3	1.2	109.1	0.15	0.14
	07:30	60	94	34	71.3	1.2	109.1	0.16	0.07
	08:00	60	94	34	71.3	1.2	109.1	0.16	0.06
	08:30	61	95	34	72.3	1.0	109.1	0.17	0.07
	09:00	60	94	34	71.3	1.0	106.7	0.15	0.07
	09:30	62	95	33	73.0	1.1	106.7	0.14	0.11
	10:00	62	95	33	73.0	2.0	109.1	0.17	-0.06
	10:30	63	96	33	74.0	1.0	106.7	0.16	0.08
	11:00	64	96	32	74.7	1.0	104.3	0.16	0.06
	11:30	64	96	32	74.7	1.0	104.3	0.17	0.06
	12:00	64	96	32	74.7	0.9	100.0	0.16	0.06
	12:30	64	95	32	74.3	0.9	102.1	0.19	0.06
	13:00	64	96	32	74.7	0.7	102.1	0.17	0.06
	13:30	65	95	30	75.0	0.6	100.0	0.17	0.09
	14:00	65	98	33	76.0	0.7	100.0	0.18	0.09
	14:30	65	96	31	75.3	0.6	102.1	0.19	0.07
	15:00	65	99	34	76.3	0.5	100.0	0.19	0.09

5. Female Weight=3.06 kg Injection Time=8.0 secs
Amount Injected=3.1 ml

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:00	47	76	29	56.7	0.8	123.1	0.73	0.22
00:02	48	76	28	57.3	1.5	120.0	0.72	0.22
00:04	47	77	30	57.0	2.0	123.1	0.71	0.24
00:06	48	77	29	57.7	2.0	123.1	0.70	0.27
00:08	47	77	30	57.0	2.0	123.1	0.76	0.28
00:10	45	75	30	55.0	1.7	123.1	0.78	0.30
00:12	45	75	30	55.0	1.7	123.1	0.74	0.27
00:14	45	75	30	55.0	1.7	123.1	0.76	0.26
00:16	45	75	30	55.0	1.5	123.1	0.78	0.22
00:18	45	75	30	55.0	1.5	123.1	0.78	0.22
00:20	45	77	32	55.7	1.5	123.1	0.80	0.19
00:22	46	77	31	56.3	1.5	123.1	0.80	0.18
00:24	45	78	33	56.0	1.2	120.0	0.77	0.17
00:26	45	77	32	55.7	1.2	123.1	0.81	0.17
00:28	45	76	31	55.3	1.2	120.0	0.75	0.20
00:30	45	76	31	55.3	1.2	123.1	0.80	0.18
00:32	46	76	30	56.0	1.1	123.1	0.82	0.20
00:34	46	76	30	56.0	1.0	123.1	0.74	0.20
00:36	46	77	31	56.3	1.2	120.0	0.75	0.20
00:38	47	77	30	57.0	1.5	123.1	0.75	0.20
00:40	46	76	30	56.0	1.0	123.1	0.75	0.22
00:42	45	76	31	55.3	1.2	123.1	0.75	0.22
00:44	45	75	30	55.0	1.0	123.1	0.72	0.22
00:46	45	75	30	55.0	1.0	123.1	0.73	0.22
00:48	46	76	30	56.0	1.0	123.1	0.74	0.22
00:50	45	74	29	54.7	1.0	123.1	0.74	0 22
00:52	45	74	29	54.7	1.1	120.0	0.74	0.23
00:54	45	74	29	54.7	1.0	120.0	0.73	0.22
00:56	45	75	30	55.0	1.0	120.0	0.72	0.22
00:58	45	75	30	55.0	1.0	123.1	0.75	0.22
01:00	45	75	30	55.0	1.1	120.0	0.77	0.22
01:10	45	75	30	55.0	1.0	120.0	0.81	0.20
01:20	45	77	32	55.7	1.0	120.0	0.81	0.20
01:30	46	78	32	56.7	0.9	120.0	0.77	0.23
01:40	46	76	30	56.0	0.9	120.0	0.74	0.25
01:50	46	76	30	56.0	1.0	120.0	0.75	0.27
02:00	49	79	30	59.0	1.0	120.0	0.80	0.25
02:30	47	76	29	56.7	0.6	-	0.72	0.27
03:00	49	80	31	59.3	0.7	120.0	0.81	0.25
03:30	50	78	28	59.3	0.7	120.0	0.74	0.30
04:00	49	79	30	59.0	0.5	120.0	0.80	0.27
04:30	49	79	30	59.0	0.5	120.0	0.77	0.27

5.

TIME	DP	SP	PP	MAP	CVP	HR	R	T
05:00	50	80	30	60.0	0.0	120.0	0.80	0.27
05:30	50	79	29	59.7	-0.5	117.1	0.82	0.25
06:00	50	81	31	60.3	0.1	120.0	0.75	0.30
06:30	50	82	32	60.7	0.0	117.1	0.80	0.28
07:00	50	82	32	60.7	0.0	117.1	0.77	0.30
07:30	50	80	30	60.0	0.0	117.1	0.72	0.27
08:00	50	83	33	61.0	0.0	114.3	0.78	0.30
08:30	50	83	33	61.0	0.0	114.3	0.75	0.26
09:00	50	82	32	60.7	0.0	117.1	0.71	0.28
09:30	50	81	31	60.3	0.0	114.3	0.78	0.30
10:00	50	81	31	60.3	0.0	114.3	0.77	-
10:30	51	84	33	62.0	0.0	114.3	0.87	0.26
11:00	50	83	33	61.0	0.0	114.3	0.78	0.30
11:30	50	83	33	61.0	0.0	114.3	0.80	0.28
12:00	50	83	33	61.0	0.0	114.3	0.91	0.26
12:30	51	85	34	62.3	0.0	111.6	0.90	0.26
13:00	51	84	33	62.0	-0.1	114.3	0.82	0.30
13:30	50	83	33	61.0	-0.2	111.6	0.88	0.28
14:00	51	84	33	62.0	0.0	111.6	0.92	0.26
14:30	51	85	34	62.3	0.0	111.6	0.92	0.26
15:00	51	85	34	62.3	0.0	111.6	0.92	0.27

6. Female Weight=3.03 kg Injection Time=11.0 secs -- Amount Injected=3.0 ml

00:00	55	92	37	67.3	0.2	120.0	0.25	0.04
00:02	55	91	36	67.0	0.0	120.0	0.19	0.02
00:04	55	90	35	66.7	0.0	120.0	0.16	0.06
00:06	55	91	36	67.0	0.2	120.0	0.17	0.05
00:08	55	93	38	67.7	0.2	120.0	0.26	0.04
00:10	55	93	38	67.7	1.0	120.0	0.32	0.04
00:12	53	91	38	65.7	0.2	120.0	0.31	0.03
00:14	53	90	37	65.3	0.5	120.0	0.26	0.03
00:16	52	88	36	64.0	0.7	120.0	0.22	0.04
00:18	52	87	35	63.7	0.5	120.0	0.20	0.05
00:20	52	88	36	64.0	0.7	120.0	0.26	0.04
00:22	51	90	39	64.0	0.4	120.0	0.27	0.02
00:24	52	90	38	64.7	0.5	120.0	0.27	0.04
00:26	51	90	39	64.0	0.2	120.0	0.29	0.04
00:28	50	88	38	62.7	0.2	120.0	0.19	0.01
00:30	50	87	37	62.3	0.2	120.0	0.20	0.04
00:32	51	88	37	63.3	0.5	120.0	0.26	0.04
00:34	51	90	39	64.0	0.2	117.1	0.26	0.02
00:36	52	90	38	64.7	0.5	120.0	0.27	0.03
00:38	52	91	39	65.0	0.2	120.0	0.29	0.04

APPENDIX (Continued.)

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:40	51	91	40	64.3	0.3	120.0	0.17	0.03
00:42	52	91	39	65.0	0.2	120.0	0.17	0.05
00:44	51	88	37	63.3	0.6	120.0	0.21	0.04
00:46	52	90	38	64.7	0.0	120.0	0.22	0.02
00:48	52	90	38	64.7	0.5	120.0	0.26	0.02
00:50	53	91	38	65.7	0.2	123.1	0.29	0.02
00:52	54	92	38	66.7	0.5	120.0	0.25	0.01
00:54	53	90	37	65.3	0.6	120.0	0.19	0.01
00:56	52	89	37	64.3	0.4	120.0	0.17	0.02
00:58	52	90	38	64.7	0.4	120.0	0.27	0.01
01:00	54	93	39	67.0	0.4	120.0	0.29	0.01
01:10	54	93	39	67.0	0.5	120.0	0.27	0.01
01:20	53	91	38	65.7	0.5	120.0	0.25	0.02
01:30	53	90	37	65.3	0.2	120.0	0.24	0.02
01:40	53	90	37	65.3	0.3	120.0	0.20	0.02
01:50	52	89	37	64.3	0.0	120.0	0.19	0.02
02:00	51	88	37	63.3	0.2	120.0	0.17	0.01
02:30	52	90	38	64.7	0.7	120.0	0.19	0.01
03:00	54	91	37	66.3	1.2	120.0	0.27	0.01
03:30	53	90	37	65.3	-0.2	120.0	0.19	0.01
04:00	55	92	37	67.3	-0.2	123.1	0.17	0.01
04:30	57	95	38	69.7	0.0	120.0	0.20	0.01
05:00	55	91	36	67.0	-	123.1	0.27	0.01
05:30	57	93	36	69.0	0.2	120.0	0.31	0.01
06:00	57	95	38	69.7	0.5	120.0	0.17	0.02
06:30	57	97	40	70.3	0.0	120.0	0.21	0.02
07:00	56	93	37	68.3	0.0	120.0	0.31	0.01
07:30	58	95	37	70.3	0.0	120.0	0.20	0.01
08:00	56	93	37	68.3	0.0	120.0	0.31	0.01
08:30	56	88	32	66.7	-0.2	120.0	0.25	0.01
09:00	58	97	39	71.0	0.0	120.0	0.20	0.04
09:30	57	94	37	69.3	0.0	120.0	0.29	0.01
10:00	56	95	39	69.0	-0.1	120.0	0.26	0.01
10:30	58	96	38	70.7	0.2	120.0	0.22	0.02
11:00	57	93	36	69.0	-	120.0	0.26	0.01
11:30	57	93	36	69.0	-0.1	120.0	-	-
12:00	57	95	38	69.7	-0.1	117.1	0.27	0.01
12:30	57	93	36	69.0	-0.1	117.1	0.16	0.02
13:00	58	96	38	70.7	-0.1	120.0	0.25	0.02
13:30	57	93	36	69.0	0.0	120.0	0.09	0.04
14:00	60	96	36	72.0	-0.2	120.0	0.25	0.02
14:30	57	93	36	69.0	-0.5	120.0	0.15	0.04
15:00	58	95	37	70.3	-0.5	120.0	0.27	0.02

7. Female Weight=2.99 kg Injection Time=4.0 secs
Amount Injected=3.0 ml

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:00	44	115	71	67.7	1.4	150.0	0.75	0.16
00:02	43	114	71	66.7	1.2	150.0	0.75	0.16
00:04	43	114	71	66.7	1.0	150.0	0.77	0.20
00:06	44	115	71	67.7	2.0	150.0	0.77	0.22
00:08	44	115	71	67.7	2.5	150.0	0.74	0.20
00: 10	43	114	71	66.7	1.7	150.0	0.75	0.16
00: 12	42	113	71	65.7	1.7	150.0	0.77	0.17
00: 14	44	116	72	68.0	2.0	150.0	0.77	0.15
00: 16	44	115	71	67.7	1.7	150.0	0.75	0.13
00: 18	44	115	71	67.7	1.5	150.0	0.77	0.15
00: 20	44	115	71	67.7	1.7	154.8	0.75	0.14
00: 22	43	114	71	66.7	1.5	150.0	0.76	0.10
00: 24	42	113	71	65.7	1.7	150.0	0.77	0.14
00: 26	43	114	71	66.7	1.7	-	-	-
00: 28	43	114	71	66.7	1.6	154.8	0.75	0.15
00: 30	42	113	71	65.7	1.5	150.0	0.80	0.12
00:32	43	114	71	66.7	2.0	150.0	0.77	0.17
00:34	42	114	72	66.0	1.7	150.0	0.75	0.15
00:36	40	110	70	63.3	1.5	150.0	0.76	0.15
00:38	40	110	70	63.3	1.5	150.0	0.76	0.15
00:40	41	111	70	64.3	2.0	150.0	0.76	0.16
00:42	41	111	70	64.3	2.0	150.0	0.75	0.15
00:44	40	110	70	63.3	2.0	150.0	0.77	0.13
00:46	40	110	70	63.3	1.7	150.0	0.79	0.15
00:48	40	111	71	63.7	2.0	150.0	0.75	0.15
00:50	39	108	69	62.0	2.0	150.0	0.75	0.15
00:52	39	108	69	62.0	2.1	150.0	0.75	0.13
00:54	39	108	69	62.0	2.0	150.0	0.80	0.16
00:56	39	109	70	62.3	2.5	150.0	0.76	0.17
00:58	40	110	70	63.3	2.2	150.0	0.75	0.15
01:00	40	110	70	63.3	1.7	150.0	0.77	0.15
01:10	41	112	71	64.7	1.7	154.8	0.72	0.15
01:20	41	112	71	64.7	1.5	150.0	0.75	0.14
01:30	40	111	71	63.7	2.0	150.0	0.70	0.15
01:40	40	108	68	62.7	1.7	150.0	0.77	0.17
01:50	40	110	70	63.3	2.2	150.0	0.71	0.16
02:00	41	112	71	64.7	1.5	150.0	0.70	0.15
02:30	43	115	72	67.0	1.0	150.0	0.75	0.14
03:00	41	112	71	64.7	0.7	150.0	0.75	0.15
03:30	41	112	71	64.7	1.0	150.0	0.70	0.15
04:00	41	114	73	65.3	1.0	150.0	0.72	0.16
04:30	42	114	72	66.0	0.7	150.0	0.75	0.15

7.

TIME	DP	SP	PP	MAP	CVP	HR	R	T
05:00	41	114	73	65.3	0.8	150.0	0.70	0.15
05:30	41	111	70	64.3	1.0	150.0	0.70	0.13
06:00	41	113	72	65.0	1.0	150.0	0.70	0.15
06:30	41	111	70	64.3	1.0	150.0	0.70	0.15
07:00	41	110	69	64.0	1.5	150.0	0.72	0.15
07:30	44	114	70	67.3	-	154.8	0.70	0.15
08:00	41	111	70	64.3	2.0	150.0	0.70	0.15
08:30	42	112	70	65.3	1.7	150.0	0.72	0.15
09:00	44	115	71	67.7	1.5	150.0	0.70	0.15
09:30	44	115	71	67.7	1.2	150.0	0.72	0.15
10:00	44	118	74	68.7	1.5	150.0	0.67	0.13
10:30	45	120	75	70.0	1.6	150.0	0.67	0.14
11:00	45	120	75	70.0	1.2	154.8	0.65	0.14
11:30	45	117	72	69.0	1.0	154.8	0.70	0.15
12:00	45	118	73	69.3	1.1	154.8	0.70	0.15
12:30	45	120	75	70.0	1.0	154.8	0.65	0.13
13:00	45	120	75	70.0	1.0	154.8	0.65	0.14
13:30	45	120	75	70.0	1.2	160.0	0.70	0.15
14:00	45	120	75	70.0	1.1	150.0	0.61	0.13
14:30	45	121	76	70.3	1.2	154.8	0.65	0.15
15:00	45	120	75	70.0	1.2	154.8	0.65	0.15

8. Female Weight=2.87 kg Injection Time=9.0 secs
Amount Injected=2.9 ml

00:00	56	91	35	67.7	1.5	171.4	0.64	0.18
00:02	56	91	35	67.7	1.6	171.4	0.63	0.15
00:04	56	92	36	68.0	1.9	184.6	0.67	0.18
00:06	56	92	36	68.0	2.0	171.4	0.66	0.22
00:08	57	92	35	68.7	2.2	171.4	0.69	0.24
00:10	57	93	36	69.0	2.2	177.8	0.66	0.24
00:12	56	91	35	67.7	2.0	177.8	0.63	0.21
00:14	57	92	35	68.7	2.1	171.4	0.66	0.18
00:16	57	92	35	68.7	1.7	184.6	0.66	0.18
00:18	56	91	35	67.7	2.0	171.4	0.66	0.15
00:20	57	93	36	69.0	1.9	177.8	0.66	0.18
00:22	56	91	35	67.7	1.7	177.8	0.65	0.15
00:24	57	91	34	68.3	1.6	171.4	0.64	0.15
00:26	57	92	35	68.7	1.5	171.4	0.66	0.15
00:28	56	90	34	67.3	1.5	171.4	0.66	0.15
00:30	57	91	34	68.3	1.5	171.4	0.67	0.15
00:32	56	91	35	67.7	1.5	177.8	0.69	0.15
00:34	56	90	34	67.3	1.6	171.4	0.66	0.13
00:36	56	90	34	67.3	1.4	177.8	0.69	0.15
00:38	57	88	31	67.3	1.4	171.4	0.66	0.15

APPENDIX (Continued.)

8.

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:40	57	91	34	68.7	1.4	171.4	0.69	0.14
00:42	55	90	35	66.7	1.2	171.4	0.69	0.16
00:44	56	92	36	68.0	1.5	171.4	0.69	0.12
00:46	56	90	34	67.3	1.2	171.4	0.68	0.14
00:48	55	90	35	66.7	1.2	171.4	0.69	0.15
00:50	56	91	35	67.7	1.2	171.4	0.69	0.12
00:52	55	90	35	66.7	1.1	177.8	0.70	0.15
00:54	56	91	35	67.7	1.2	177.8	0.69	0.15
00:56	56	90	35	66.7	1.1	-	-	-
00:58	56	91	35	67.7	1.2	171.4	0.69	0.15
01:00	57	92	35	68.7	1.0	171.4	0.69	0.12
01:10	58	94	36	70.0	1.0	171.4	0.70	0.13
01:20	59	95	36	71.0	1.2	171.4	0.70	0.13
01:30	59	94	35	70.7	1.0	171.4	0.70	0.11
01:40	59	95	36	71.0	1.0	171.4	0.71	0.12
01:50	60	95	35	71.7	0.6	171.4	0.73	0.12
02:00	60	95	35	71.7	0.7	171.4	0.72	0.13
02:30	60	95	35	71.7	0.5	165.5	0.78	0.15
03:00	56	94	38	68.7	0.4	165.5	0.78	0.15
03:30	55	90	35	66.7	0.1	171.4	0.81	0.19
04:00	55	90	35	66.7	0.0	160.0	0.82	0.18
04:30	55	90	35	66.7	0.2	160.0	0.82	0.18
05:00	54	89	35	65.7	0.0	160.0	0.82	0.18
05:30	54	91	37	66.3	0.0	160.0	0.83	0.15
06:00	55	91	36	67.0	0.1	160.0	0.79	0.17
06:30	55	91	36	67.0	0.1	160.0	0.85	0.12
07:00	55	91	36	67.0	0.0	154.8	0.87	0.15
07:30	55	91	36	67.0	0.1	160.0	0.91	0.17
08:00	56	92	36	68.0	0.3	160.0	0.85	0.18
08:30	57	94	37	69.3	0.5	160.0	0.84	0.18
09:00	58	95	37	70.3	0.0	160.0	0.81	0.18
09:30	58	94	36	70.0	0.1	160.0	0.84	0.16
10:00	58	94	36	70.0	0.0	160.0	0.84	0.19
10:30	59	95	36	71.0	0.1	160.0	0.81	0.18
11:00	58	95	37	70.3	0.0	154.8	0.84	0.16
11:30	58	94	36	70.0	0.0	154.8	0.81	0.21
12:00	58	94	36	70.0	0.0	154.8	0.84	0.15
12:30	60	95	35	71.7	0.5	154.8	0.86	0.19
13:00	57	95	38	69.7	0.2	154.8	0.85	0.21
13:30	57	94	37	69.3	0.0	154.8	0.85	0.18
14:00	56	94	38	68.7	0.0	154.8	0.84	0.22
14:30	56	96	40	69.3	0.0	154.8	0.86	0.23
15:00	56	96	40	69.3	0.1	154.8	0.86	0.21

APPENDIX (Continued.)

9. Female Weight=2.79 **kg** **Injection** Time=8.5 secs
Amount Injected=2.8 ml

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:00	82	109	27	91.0	-0.2	129.8	0.24	-0.06
00:02	82	107	25	90.3	-0.7	129.8	0.23	-0.06
00:04	83	109	26	91.7	-0.5	129.8	0.20	-0.06
00:06	84	109	25	92.3	-0.5	126.3	0.21	-0.06
00:08	83	108	25	91.3	-0.5	126.3	0.22	-0.04
00:10	82	108	26	90.7	-0.5	126.3	0.22	-0.06
00:12	81	108	27	90.0	-0.5	129.8	0.20	-0.06
00:14	81	107	26	89.7	-0.7	129.8	0.20	-
00:16	81	107	26	89.7	-0.6	129.8	0.21	-0.04
00:18	83	108	25	91.3	-0.7	126.3	0.21	-0.04
00:20	83	107	24	91.0	-0.7	126.3	0.21	-0.04
00:22	83	107	24	91.0	-0.7	129.8	0.22	-0.05
00:24	83	107	24	91.0	-0.2	126.3	0.20	-0.04
00:26	83	108	25	91.3	-0.7	129.7	0.20	-0.06
00:28	83	108	25	91.3	-0.7	126.3	0.20	-0.04
00:30	84	108	24	92.0	-0.7	126.3	0.18	-0.02
00:32	84	107	23	91.7	-0.5	129.8	0.22	-0.08
00:34	83	109	26	91.7	-0.7	129.8	0.20	-0.06
00:36	82	107	25	90.3	-0.7	126.3	0.20	-0.05
00:38	83	108	25	91.3	-0.7	126.3	0.22	-0.09
00:40	82	107	25	90.3	-0.7	126.3	0.20	-0.07
00:42	83	108	25	91.3	-0.7	126.3	0.20	-0.06
00:44	82	107	25	90.3	-0.5	126.3	0.22	-0.06
00:46	82	107	25	90.3	-0.5	126.3	0.22	-0.06
00:48	82	109	27	91.0	-0.5	126.3	0.20	-0.06
00:50	82	109	27	91.0	-0.7	126.3	0.20	-0.06
00:52	81	107	26	89.7	-0.9	126.3	0.22	-0.06
00:54	81	106	25	89.3	-0.7	126.3	0.20	-0.07
00:56	82	108	26	90.7	-0.5	126.3	0.19	-0.06
00:58	81	107	26	89.7	-0.5	123.1	0.18	-0.08
01:00	82	110	28	91.3	-0.7	126.3	0.22	-0.06
01:10	80	107	27	89.0	-0.5	126.3	0.19	-0.06
01:20	81	109	28	90.3	0.0	126.3	0.20	-0.04
01:30	81	107	26	89.7	-0.7	126.3	0.22	-0.06
01:40	81	109	28	90.3	-0.5	126.3	0.20	-0.06
01:50	80	107	27	89.0	-0.7	126.3	0.22	-0.06
02:00	80	107	27	89.0	-0.7	126.3	0.22	-0.07
02:30	79	106	27	88.0	-1.0	126.3	0.22	-0.07
03:00	80	107	27	89.0	-1.2	126.3	0.22	-0.06
03:30	80	108	28	89.3	-1.0	123.1	0.23	-0.07
04:00	80	106	26	88.7	-1.2	120.0	0.22	-0.06
04:30	81	107	26	89.7	-0.5	120.0	-	-

	TIME	DP	SP	PP	MAP	CVP	HR	R	T
9.	05:00	81	107	26	89.7	-1.2	123.1	0.22	-0.06
	05:30	80	106	26	88.7	-1.2	123.1	0.23	-0.06
	06:00	80	107	27	89.0	-1.5	123.1	0.24	-0.06
	06:30	80	106	26	88.7	-1.0	123.1	0.20	-0.06
	07:00	79	105	26	87.7	-1.5	123.1	0.24	-0.06
	07:30	80	108	2%	89.3	-1.7	120.0	0.24	-0.06
	08:00	79	106	27	88.0	-1.5	123.1	0.25	-0.05
	08:30	80	105	25	88.3	-1.0	120.0	0.23	-0.06
	09:00	82	104	22	89.3	-1.5	120.0	0.25	-0.06
	09:30	82	104	22	89.3	-0.7	120.0	0.25	-0.06
	10:00	76	105	29	85.7	-1.0	123.1	0.26	-0.07
	10:30	76	103	27	85.0	-1.0	120.0	0.26	-0.06
	11:00	75	103	28	84.3	-1.0	120.0	0.26	-0.06
	11:30	75	103	28	84.3	-1.2	120.0	0.26	-0.06
	12:00	75	103	28	84.3	-1.0	120.0	0.25	-0.06
	12:30	71	100	29	80.7	-1.2	123.1	0.26	-0.04
	13:00	73	102	29	82.7	-0.7	123.1	0.22	-0.06
	13:30	69	99	30	79.0	-1.2	-	-	-
	14:00	69	99	30	79.0	-1.5	123.1	0.26	-0.06
	14:30	70	100	30	80.0	-1.0	123.1	0.26	-0.06
	15:00	68	98	30	78.0	-1.0	123.1	0.26	-0.05
10.	Female Weight=2.58 kg Injection Time=6.0 secs Amount Injected=2.6 ml								
	00:00	50	89	39	63.0	0.0	165.5	0.85	0.36
	00:02	50	90	40	63.3	0.7	165.5	0.83	0.37
	00:04	50	90	40	63.3	1.5	160.0	0.87	0.45
	00:06	50	90	40	63.3	1.5	160.0	0.90	0.51
	00:08	50	90	40	63.3	1.2	165.5	0.91	0.51
	00:10	49	90	41	62.7	1.1	165.5	0.87	0.51
	00:12	49	89	40	62.3	1.2	160.0	0.85	0.51
	00:14	49	88	39	62.0	1.0	-	-	-
	00:16	50	90	40	63.3	0.7	171.4	0.83	0.43
	00:18	49	89	40	62.3	1.1	165.5	0.87	0.37
	00:20	49	89	40	62.3	1.0	165.5	0.85	0.41
	00:22	49	89	40	62.3	0.7	165.5	0.84	0.37
	00:24	50	90	40	63.3	0.7	171.4	0.85	0.36
	00:26	50	89	39	63.3	0.8	165.5	0.86	0.37
	00:28	49	89	40	62.3	0.7	160.0	0.85	0.37
	00:30	50	90	40	63.3	0.7	165.5	0.85	0.35
	00:32	50	90	40	63.3	1.0	160.0	0.85	0.39
	00:34	50	89	39	63.0	0.7	160.0	0.85	0.36
	00:36	50	90	40	63.3	0.7	165.5	0.85	0.35
	00:38	50	90	40	63.3	1.0	165.5	0.85	0.35

11.

TIME	DP	SP	PP	MAP	CVP	HR	R	T
05:00	72	99	27	81.0	0.7	126.3	0.32	0.00
05:30	71	99	28	80.3	0.7	129.7	0.31	0.00
06:00	72	100	28	81.3	0.6	126.3	0.32	0.00
06:30	73	99	26	81.7	0.5	126.3	0.33	0.00
07:00	73	98	25	81.3	0.2	126.3	0.32	0.00
07:30	72	99	27	81.0	0.2	126.3	0.32	0.00
08:00	71	99	28	80.3	0.1	126.3	0.33	0.00
08:30	72	99	27	81.0	0.2	123.1	0.32	0.00
09:00	71	98	27	80.0	0.1	126.3	0.32	0.00
09:30	71	98	27	80.0	0.2	126.3	0.31	0.00
10.00	71	97	26	79.7	0.0	123.1	0.33	0.00
10:30	71	97	26	79.7	0.2			
11:00	70	96	26	78.7	-0.1	123.1	0.32	0.01
11:30	71	96	25	79.3	-0.1	120.0	0.31	0.01
12:00	70	95	25	78.3	0.0	120.0	0.32	0.01
12:30	70	95	25	78.3	-0.2	120.0	0.32	0.01
13:00	70	95	25	78.3	-0.2	120.0	0.30	0.01
13:30	70	95	25	78.3	-0.6	120.0	0.32	0.01
14:00	70	95	25	78.3	-0.7	120.0	0.31	0.01
14:30	70	94	24	78.0	-0.5	120.0	0.32	0.01
15:00	70	94	24	78.0	-0.5	117.1	0.31	0.01

12. Male Weight=5.93 kg Injection Time=16.0 secs
Amount Injected=5.9 ml

00:00	100	175	75	125.0	0.7	200.0	0.14	-0.10
00:02	100	175	75	125.0	0.7	200.0	0.06	-0.11
00:04	99	170	71	122.7	1.0	200.0	0.11	-0.14
00:06	102	178	76	127.3	1.0	200.0	0.15	-0.14
00:08	100	180	80	126.7	1.7	200.0	0.14	-0.11
00:10	99	175	76	124.3	1.5	200.0	0.14	-0.09
00:12	97	167	70	120.3	1.5	200.0	0.12	-0.11
00:14	95	168	73	119.3	2.0	200.0	0.15	-0.15
00:16	98	176	78	124.0	1.7	200.0	0.16	-0.12
00:18	95	174	79	121.3	1.5	200.0	0.07	-0.15
00:20	95	169	74	119.7	1.5	200.0	0.10	-0.06
00:22	94	165	71	117.7	1.5	200.0	0.09	-0.12
00:24	94	175	81	121.0	1.7	200.0	0.15	-0.15
00:26	95	175	80	121.7	1.7	200.0	0.14	-0.12
00:28	95	168	73	119.3	1.2	200.0	0.09	-0.09
00:30	95	164	69	118.0	-	200.0	0.07	-0.14
00:32	98	168	70	121.3	-	200.0	0.15	-0.14
00:34	100	175	75	125.0	-	200.0	0.09	-0.12
00:36	98	176	78	124.0	1.5	200.0	0.09	-0.07
00:38	96	173	77	121.7	2.0	200.0	0.07	-0.09

APPENDIX (**Continued**)

12.

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:40	95	165	70	118.3	1.2	200.0	0.12	-0.15
00:42	96	177	81	123.0	1.2	200.0	0.14	-0.11
00:44	99	178	79	125.3	1.0	200.0	0.10	-0.07
00:46	96	170	74	120.7	1.4	200.0	0.09	-0.11
00:48	97	173	76	122.3	1.5	200.0	0.10	-0.14
00:50	98	179	81	125.0	1.2	200.0	0.15	-0.12
00:52	99	178	79	125.3	1.7	200.0	0.11	-0.07
00:54	97	174	77	122.7	1.0	200.0	0.09	-0.09
00:56	96	162	71	119.7	1.2	200.0	0.12	-0.14
00:58	95	176	81	122.0	1.0	200.0	0.12	-0.12
01:00	98	178	80	124.7	1.0	200.0	0.14	-0.09
01:10	98	176	78	124.0	0.7	200.0	0.11	-0.09
01:20	98	172	74	122.7	0.7	200.0	0.07	-0.11
01:30	96	167	71	119.7	1.0	200.0	0.12	-0.15
01:40	99	177	78	125.0	1.0	200.0	0.14	-0.08
01:50	100	178	78	126.0	0.7	200.0	0.10	-0.10
02:00	99	174	75	124.0	0.7	200.0	0.10	-0.12
02:30	100	175	75	125.0	0.7	200.0	0.15	-0.11
03:00	98	168	70	121.3	1.0	200.0	0.14	-0.14
03:30	99	174	75	124.0	1.0	200.0	0.14	-0.14
04:00	97	169	72	121.0	0.7	200.0	0.12	-0.14
04:30	100	173	73	124.3	-	200.0	0.10	-0.14
05:00	98	180	82	125.3	1.1	200.0	0.09	-0.12
05:30	95	168	73	119.3	0.7	200.0	0.14	-0.10
06:00	90	161	71	113.7	1.0	200.0	0.14	-0.10
06:30	88	162	74	112.7	1.4	200.0	0.08	-0.10
07:00	84	158	74	108.7	1.2	200.0	0.11	-0.14
07:30	80	162	82	107.3	1.2	200.0	0.10	-0.16
08:00	84	164	80	110.7	1.5	200.0	0.07	-0.12
08:30	83	150	67	105.3	1.2	200.0	0.06	-0.15
09:00	82	148	66	104.0	1.0	200.0	0.11	-0.14
09:30	84	152	68	106.7	0.9	200.0	0.11	-0.15
10:00	85	152	67	107.3	1.0	-	-	-
10:30	85	152	67	107.3	1.1	200.0	0.11	-0.15
11:00	85	154	69	108.0	1.0	200.0	0.11	-0.16
11:30	85	149	64	106.3	1.0	200.0	0.11	-0.12
12:00	84	149	65	105.7	1.2	200.0	0.12	-0.14
12:30	82	143	61	102.3	1.2	200.0	0.12	-0.12
13:00	83	148	65	104.7	1.0	200.0	0.07	-0.16
13:30	79	132	53	96.7	1.1	200.0	0.12	-0.15
14:00	80	145	65	101.7	1.0	200.0	0.12	-0.14
14:30	80	140	60	100.0	1.2	200.0	0.07	-0.16
15:00	78	135	57	97.0	0.9	200.0	0.12	-0.15

13. Male Weight=1.97 kg Injection Time=9.5 secs
Amount Injected=2.0 ml

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:00	40	87	47	55.7	0.0	129.7	0.42	0.06
00:02	40	87	47	55.7	0.0	133.3	0.43	0.07
00:04	40	87	47	55.7	0.2	133.3	0.42	0.06
00:06	40	87	47	55.7	0.2	133.3	0.34	0.06
00:08	38	92	54	56.0	0.5	133.3	0.42	0.06
00:10	38	85	47	53.7	0.2	133.3	0.42	0.07
00:12	40	87	47	55.7	0.2	133.3	0.43	0.06
00:14	40	87	47	55.7	0.0	129.7	0.42	0.06
00:16	38	86	48	54.0	0.0	129.7	0.43	0.07
00:18	40	87	47	55.7	0.0	133.3	0.42	0.06
00:20	39	86	47	54.7	0.0	133.3	0.42	0.06
00:22	39	86	47	54.7	0.0	133.3	0.42	0.07
00:24	39	87	48	55.0	0.0	129.7	0.42	0.07
00:26	39	86	47	54.7	0.1	129.7	0.42	0.07
00:28	39	87	48	55.0	0.0	129.7	0.42	0.07
00:30	39	87	48	55.0	0.0	129.7	0.42	0.07
00:32	40	87	47	55.7	0.0	129.7	0.42	0.07
00:34	40	86	46	55.3	-0.2	129.7	0.42	0.07
00:36	39	87	48	55.0	0.2	129.7	0.42	0.06
00:38	40	88	48	56.0	0.0	133.3	0.42	0.07
00:40	38	86	48	54.0	-0.1	129.7	0.42	0.07
00:42	39	87	48	55.0	0.0	129.7	0.42	0.06
00:44	40	87	47	55.7	-0.2	129.7	0.42	0.07
00:46	40	87	47	55.7	0.0	129.7	0.42	0.06
00:48	40	87	47	55.7	0.0	129.7	0.42	0.08
00:50	39	86	47	54.7	0.0	133.3	0.42	0.08
00:52	39	87	48	55.0	0.1	129.7	0.42	0.07
00:54	40	86	46	55.3	0.0	129.7	0.42	0.08
00:56	39	86	47	54.7	0.0	129.7	0.42	0.08
00:58	39	87	48	55.0	0.0	129.7	0.42	0.07
01:00	-39	86	47	54.7	0.0	129.7	0.42	--0.07
01:10	38	85	47	53.7	0.0	133.3	0.42	0.07
01:20	38	85	47	53.7	0.0	133.3	0.42	0.08
01:30	37	85	48	53.0	-0.1	129.7	0.42	0.09
01:40	37	84	47	52.7	-0.2	133.3	0.41	0.08
01:50	36	84	48	52.0	-0.2	129.7	0.42	0.08
02:00	36	84	48	52.0	-0.5	129.7	0.42	0.09
02:30	36	83	47	51.7	-0.2	129.7	0.42	0.09
03:00	35	80	45	50.0	-0.2	129.7	0.41	0.08
03:30	35	79	44	49.7	-0.5	129.7	0.40	0.09
04:00	35	79	44	49.7	-0.2	129.7	0.41	0.08
04:30	35	80	45	50.0	-0.2	129.7	0.41	0.07

APPENDIX (**Continued**)

14.

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:40	52	90	38	64.7	1.4	120.0	0.15	-0.20
00:42	51	86	35	62.7	1.0	120.0	0.16	-0.17
00:44	53	91	38	65.7	1.2	117.1	0.13	-0.19
00:46	52	86	34	63.3	1.0	120.0	0.15	-0.17
00:48	53	88	35	64.7	1.0	120.0	0.12	-0.16
00:50	54	90	36	66.0	1.1	120.0	0.18	-0.18
00:52	52	87	35	63.7	1.0	120.0	0.17	-0.20
00:54	52	90	38	64.7	1.0	120.0	0.11	-0.16
00:56	51	86	35	62.7	0.6	120.0	0.18	-0.17
00:58	53	90	37	65.3	1.0	120.0	0.13	-0.08
01:00	51	86	35	62.7	0.7	120.0	0.18	-0.23
01:10	55	90	35	66.7	1.0	120.0	0.15	-0.17
01:20	54	88	34	65.3	1.0	120.0	0.16	-0.22
01:30	53	89	36	65.0	0.7	120.0	0.18	-0.20
01:40	55	93	38	67.7	1.1	120.0	0.12	-0.15
01:50	55	90	35	66.7	1.0	120.0	0.20	-0.17
02:00	55	91	36	67.0	0.7	120.0	0.18	-0.18
02:30	57	92	35	68.7	0.7	120.0	0.16	-0.20
03:00	58	94	36	70.0	1.0	120.0	0.21	-0.17
03:30	60	95	35	71.7	0.7	120.0	0.23	-0.20
04:00	59	90	31	69.3	0.7	120.0	0.21	-0.13
04:30	60	91	31	70.3	0.6	120.0	0.18	-0.12
05:00	59	95	36	71.0	0.7	120.0	0.20	-0.20
05:30	60	94	34	71.3	0.7	120.0	0.20	-0.16
06:00	60	96	36	72.0	0.7	120.0	0.16	-0.16
06:30	63	97	34	74.3	0.5	120.0	0.18	-0.10
07:00	61	97	36	73.0	0.7	120.0	0.21	-0.18
07:30	61	98	37	73.3	0.7	120.0	0.22	-0.20
08:00	62	98	36	74.0	0.7	120.0	0.22	-0.18
08:30	63	100	37	75.3	0.9	120.0	0.23	-0.20
09:00	63	100	37	75.3	0.7	120.0	0.22	-0.20
09:30	64	100	36	76.0	0.7	120.0	0.25	-0.20
10:00	63	99	36	75.0	0.5	120.0	0.21	-0.20
10:30	63	99	36	75.0	0.3	120.0	0.17	-0.18
11:00	65	100	35	76.7	0.5	120.0	0.16	-0.15
11:30	65	100	35	76.7	0.5	120.0	0.26	-0.20
12:00	65	100	35	76.7	0.7	120.0	0.16	-0.15
12:30	66	103	37	78.3	0.7	120.0	0.18	-0.16
13:00	65	102	37	77.3	0.5	120.0	0.26	-0.21
13:30	67	104	37	79.3	0.3	120.0	0.25	-0.21
14:00	67	102	35	78.7	0.5	120.0	0.17	-0.28
14:30	69	105	36	81.0	0.7	120.0	0.16	-0.16
15:00	70	106	36	82.0	0.7	120.0	0.15	-0.17

15. Male (Neutered) Weight=4.50 kg
Injection Time=7.0 secs Amount Injected=4.5 ml

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:00	46	76	30	56.0	2.7	154.8	0.29	0.51
00:02	46	76	30	56.0	3.5	160.0	0.30	0.51
00:04	47	77	30	57.0	3.5	160.0	0.27	0.52
00:06	49	80	31	59.3	3.7	160.0	0.30	0.57
00:08	49	80	31	59.3	3.8	160.0	0.33	0.57
00:10	46	77	31	56.3	3.7	160.0	0.31	0.56
00:12	45	75	30	55.0	3.5	160.0	0.29	0.54
00:14	46	76	30	56.0	3.2	160.0	0.29	0.54
00:16	46	76	30	56.0	3.5	160.0	0.30	0.54
00:18	46	76	30	56.0	3.5	160.0	0.29	0.51
00:20	46	76	30	56.0	3.2	160.0	0.28	0.49
00:22	48	77	29	57.7	3.2	160.0	0.30	0.51
00:24	47	79	32	57.7	3.5	160.0	0.30	0.49
00:26	48	77	29	57.7	3.2	160.0	0.30	0.48
00: 28	49	78	29	58.7	3.1	160.0	0.30	0.48
00:30	49	79	30	59.0	3.2	160.0	0.30	0.49
00:32	48	79	31	58.3	3.2	160.0	0.30	0.49
00:34	48	78	30	58.0	3.2	160.0	0.28	0.48
00:36	49	79	30	59.0	3.2	160.0	0.28	0.49
00:38	49	79	30	59.0	3.2	160.0	0.30	0.48
00:40	49	79	30	59.0	3.4	160.0	0.29	0.50
00:42	48	78	30	58.0	3.2	160.0	0.28	0.48
00:44	48	79	31	58.3	3.2	160.0	0.28	0.48
00:46	48	79	31	58.3	3.2	160.0	0.27	0.48
00:48	47	77	30	57.0	3.2	160.0	0.30	0.48
00:50	47	77	30	57.0	3.1	160.0	0.27	0.45
00:52	47	77	30	57.0	3.0	160.0	0.28	0.48
00:54	47	79	32	57.7	3.1	160.0	0.30	0.48
00:56	47	79	32	57.7	3.4	160.0	0.30	0.48
00:58	47	77	30	57.0	3.1	160.0	0.28	0.49
01:00	48	79	31	58.3	3.2	160.0	0.28	0.46
01:10	47	78	31	57.3	3.3	160.0	0.29	0.48
01:20	49	79	30	59.0	3.0	160.0	0.27	0.49
01:30	50	79	29	59.7	2.7	160.0	0.28	0.46
01:40	50	80	30	60.0	3.0	160.0	0.29	0.48
01:50	49	80	31	59.3	2.7	-	-	-
02:00	50	80	30	60.0	2.6	160.0	0.31	0.48
02:30	50	80	30	60.0	2.7	160.0	0.31	0.49
03:00	49	80	31	59.3	2.7	160.0	0.30	0.49
03:30	48	77	29	57.7	2.7	154.8	0.31	0.49
04:00	46	76	30	56.0	2.7	154.8	0.30	0.51
04:30	46	76	30	56.0	2.2	154.8	0.30	0.48

	TIME	DP	SP	PP	MAP	CVP	HR	R	T
15.	05:00	46	80	34	57.3	2.5	154.8	0.31	0.49
	05:30	50	79	29	59.7	2.4	154.8	0.31	0.49
	06:00	46	80	34	57.3	2.5	154.8	0.31	0.49
	06:30	46	80	34	57.3	3.0	160.0	0.33	0.48
	07:00	46	78	32	56.7	3.0	160.0	0.33	0.49
	07:30	46	78	32	56.7	3.0	154.8	0.33	0.48
	08:00	47	78	31	57.3	3.0	150.0	0.33	0.51
	08:30	50	81	31	60.3	2.7	154.8	0.33	0.51
	09:00	50	84	34	61.3	3.0	154.8	0.31	0.49
	09:30	50	85	35	61.7	3.0	160.0	0.31	0.49
	10:00	50	84	34	61.3	3.0	154.8	0.33	0.51
	10:30	50	84	34	61.3	2.7	154.8	0.31	0.52
	11:00	48	82	34	59.3	3.0	154.8	0.31	0.51
	11:30	45	84	39	58.0	2.8	154.8	0.33	0.49
	12:00	45	82	37	57.3	2.7	154.8	0.33	0.51
	12:30	44	77	33	55.0	3.0	150.0	0.33	0.49
	13:00	44	76	32	54.7	3.0	150.0	0.30	0.50
	13:30	44	75	31	54.3	3.2	154.8	0.32	0.49
	14:00	41	74	33	52.0	3.1	154.8	0.31	0.48
	14:30	41	74	33	52.0	3.0	150.0	0.31	0.49
	15:00	44	75	31	54.3	2.9	150.0	0.33	0.49

16. Male (Neutered) Weight=4.39 kg
Injection Time=22.5 secs Amount Injected=4.4 ml

00:00	84	146	62	104.7	1.7	165.5	0.61	0.18
00:02	86	149	63	107.0	1.7	165.5	0.61	0.17
00:04	85	147	62	105.7	2.1	160.0	0.63	0.18
00:06	85	145	60	105.0	2.2	165.5	0.61	0.18
00:08	84	145	61	104.3	2.4	165.5	0.63	0.18
00:10	83	143	60	103.0	2.5	165.5	0.62	0.18
00:12	84	145	61	104.3	2.5	165.5	0.63	0.18
00:14	84	145	61	104.3	2.5	165.5	0.63	0.16
00:16	84	144	60	104.0	2.5	165.5	0.63	0.17
00:18	84	146	62	104.7	2.5	165.5	0.63	0.17
00:20	84	147	63	105.0	2.5	160.0	0.63	0.15
00:22	84	145	61	104.3	2.4	160.0	0.63	0.16
00:24	84	145	61	104.3	2.5	165.5	0.63	0.16
00:26	84	145	61	104.3	2.5	160.0	0.63	0.16
00:28	84	145	61	104.3	2.5	160.0	0.63	0.16
00:30	84	145	61	104.3	2.4	165.5	0.63	0.16
00:32	84	144	60	104.0	2.2	165.5	0.62	0.16
00:34	84	145	61	104.3	2.5	165.5	0.63	0.17
00:36	84	147	63	105.0	2.2	160.0	0.61	0.16
00:38	84	145	61	104.3		165.5	0.63	0.17

APPENDIX (**Continued.**)

16.

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:40	84	145	61	104.3	2.5	165.5	0.62	0.16
00:42	84	145	61	104.3	2.5	160.0	0.63	0.16
00:44	84	146	62	104.7	2.4	160.0	0.63	0.16
00:46	84	145	61	104.3	2.5	165.5	0.63	0.16
00:48	84	145	61	104.3	2.3	160.0	0.63	0.16
00:50	84	145	61	104.3	2.5	160.0	0.63	0.17
00:52	84	145	61	104.3	2.5	160.0	0.63	0.18
00:54	84	145	61	104.3	2.5	160.0	0.63	0.18
00:56	84	145	61	104.3	2.5	160.0	0.63	0.16
00:58	84	145	61	104.3	2.2	-	-	-
01:00	84	146	62	104.7	2.2	160.0	0.61	0.18
01:10	84	145	61	104.3	2.2	160.0	0.63	0.17
01:20	84	144	60	104.0	2.2	160.0	0.63	0.17
01:30	84	145	61	104.3	2.4	160.0	0.63	0.16
01:40	84	144	60	104.0	2.2	160.0	0.61	0.16
01:50	83	147	64	104.3	2.2	160.0	0.63	0.16
02:00	83	144	61	103.3	2.2	160.0	0.63	0.16
02:30	84	145	61	104.3	2.5	160.0	0.61	0.16
03:00	84	144	60	104.0	2.2	-	-	-
03:30	85	146	61	105.3	2.5	160.0	0.61	0.16
04:00	85	144	59	104.7	2.5	160.0	0.61	0.16
04:30	85	145	60	105.0	2.5	160.0	0.61	0.16
05:00	85	144	59	104.7	2.5	160.0	0.63	0.17
05:30	85	144	59	104.7	2.5	160.0	0.62	0.15
06:00	85	144	59	104.7	2.1	160.0	0.63	0.16
06:30	87	145	58	106.3	2.7	160.0	0.61	0.16
07:00	87	146	59	106.7	2.2	160.0	0.61	0.16
07:30	88	147	59	107.7	2.2	160.0	0.62	0.15
08:00	88	147	59	107.7	2.5	160.0	0.63	0.17
08:30	90	148	58	109.3	2.4	160.0	0.61	0.15
09:00	89	149	60	109.0	2.5	160.0	0.62	0.15
09:30	89	148	59	108.7	2.2	165.5	0.62	0.15
10:00	90	150	60	110.0	2.2	160.0	0.61	0.15
10:30	90	147	57	109.0	2.5	160.0	0.60	0.15
11:00	90	150	60	110.0	2.5	165.5	0.60	0.14
11:30	89	149	60	109.0	2.3	165.5	0.61	0.15
12:00	88	148	60	108.0	2.2	165.5	0.60	0.14
12:30	88	150	62	108.7	2.2	165.5	0.60	0.15
13:00	87	149	62	107.7	2.2	160.0	0.61	0.15
13:30	88	150	62	108.7	2.2	171.4	0.60	0.14
14:00	86	150	64	107.3	2.2	171.4	0.60	0.14
14:30	86	147	61	106.3	2.5	165.5	0.60	0.15
15:00	86	150	64	107.3	2.2	171.4	0.60	0.14

DMSO Treatment Data

17. Female Weight=4.24 kg
Injection Time=14.0 secs Amount Injected=4.2 ml

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:00	65	122	57	84.0	1.5	75.0	0.16	0.07d
00:02	65	122	57	84.0	1.4	73.8	0.17	0.07d
00:04	65	122	57	84.0	1.5	77.4	0.18	0.06d
00:06	65	123	58	84.3	1.6	77.4	0.16	0.07d
00:08	65	123	58	84.3	2.7	-	0.16	0.07d
00: 10	63	121	58	82.3	2.2	75.0	0.16	0.04d
00: 12	60	117	57	79.0	3.0	73.8	0.19	0.06d
00: 14	52	110	58	71.3	3.2	70.6	0.22	0.06d
00: 16	49	104	55	67.3	4.0	68.6	0.25	0.09d
00: 18	44	97	53	61.7	4.2	66.7	0.29	0.12d
00: 20	40	91	51	57.0	4.7	66.7	0.34	0.18d
00: 22	38	86	48	54.0	5.0	64.0	0.39	0.21d
00: 24	35	80	45	50.0	5.4	62.3	0.40	0.24d
00: 26	35	75	40	48.3	5.7	63.2	0.41	0.24d
00: 28	32	71	39	45.0	5.9	61.5	0.41	0.26d
00:30	30	67	37	42.3	6.4	62.3	0.42	0.27d
00: 32	30	64	34	41.3	7.0	64.0	0.42	0.27d
00: 34	27	62	35	38.7	7.0	64.9	0.43	0.27d
00:36	27	60	33	38.0	7.0	66.7	0.43	0.27
00: 38	27	58	31	37.3	7.2	66.7	0.42	0.28
00:40	30	57	27	39.0	6.7	66.7	0.42	0.29
00:42	30	55	25	38.3	7.5	70.6	0.43	0.30
00:44	27	55	28	36.3	7.2	70.6	0.42	0.30
00: 46	28	55	27	37.0	7.2	70.6	0.42	0.31
00: 48	29	56	27	38.0	7.1	71.6	0.41	0.32
00: 50	30	55	25	38.3	7.2	71.6	0.42	0.34
00: 52	30	56	26	38.7	7.1	73.8	0.42	0.34
00: 54	30	57	27	39.0	7.3	73.8	0.41	0.35
00: 56	30	57	27	39.0	7.2	75.0	0.39	0.36
00: 58	31	60	29	40.7	7.5	75.0	0.39	0.36
01:00	32	61	29	41.7	7.2	75.0	0.39	0.37
01: 10	35	70	35	46.7	6.7	-	0.34	0.36
01:20	39	76	37	51.3	6.2	76.2	0.29	0.34
01:30	43	85	42	57.0	6.5	77.4	0.25	0.22
01:40	44	90	46	59.3	6.4	76.2	0.20	0.14
01:50	44	95	51	61.0	6.0	75.0	0.18	0.09
02:00	45	98	53	62.7	5.7	75.0	0.16	0.06d
02: 30	51	104	53	68.7	7.0	72.7	0.12	-0.10d
03:00	55	110	55	73.3	7.0	72.7	0.12	-0.14d
03: 30	60	115	55	78.3	7.2	70.6	0.12	-0.15d
04:00	64	117	53	81.7	7.5	71.6	0.13	-0.12d
04:30	62	117	55	80.3	6.5	70.6	0.13	-0.11d

17.

TIME	DP	SP	PP	MAP	CVP	HR	R	T
05:00	66	123	57	85.0	6.7	70.6	0.14	-0.09d
05:30	67	125	58	86.3	6.2	70.6	0.13	-0.10d
06:00	69	127	58	88.3	6.2	68.6	0.16	-0.09d
06:30	74	130	56	92.7	6.0	68.6	0.15	-0.10d
07:00	71	130	59	90.7	5.5	68.6	0.16	0.09d
07:30	77	135	58	96.3	5.7	70.6	0.18	0.09d
08:00	76	135	59	95.7	5.2	70.6	0.17	0.09d
08:30	79	137	58	98.3	5.2	70.6	0.18	0.09d
09:00	77	140	63	98.0	5.2	68.6	0.18	0.09d
09:30	79	140	61	99.3	5.2	68.6	0.18	0.10d
10:00	82	145	63	103.0	5.2	68.6	0.18	0.12d
10:30	84	145	61	104.3	4.7	68.6	0.19	0.10d
11:00	85	150	65	106.7	4.7	-	-	-
11:30	85	150	65	106.7	4.6	68.6	0.18	0.07d
12:00	86	154	68	108.7	4.7	68.6	0.18	0.09d
12:30	90	155	65	111.7	4.7	69.6	0.18	0.09d
13:00	90	157	67	112.3	4.6	69.6	0.18	0.10d
13:30	95	163	68	117.7	4.5	67.6	0.19	0.10d
14:00	94	162	68	116.7	4.2	70.6	0.19	0.09
14:30	96	165	69	119.0	4.2	70.6	0.18	0.10
15:00	99	166	67	121.3	4.0	69.6	0.18	0.10

18. Female Weight=3.78 kg Injection Time=12.5 secs
Amount Injected=3.8 ml

00:00	51	97	46	66.3	1.0	165.5	0.57	0.10
00:02	50	95	45	65.0	0.7	165.5	0.50	0.07
00:04	52	98	46	67.3	0.7	165.5	0.49	0.10
00:06	53	99	46	68.3	0.8	165.5	0.50	0.10
00:08	51	99	48	67.0	1.2	165.5	0.50	0.10
00:10	48	91	43	62.3	2.0	165.5	0.58	0.10
00:12	45	91	46	60.3	2.2	165.5	0.66	0.10
00:14	40	87	47	55.7	2.5	150.0	0.77	0.03
00:16	39	84	45	54.0	2.1	141.2	0.88	0.13
00:18	36	79	43	50.3	2.0	139.5	0.92	0.15
00:20	34	76	42	48.0	2.5	126.3	0.92	0.17
00:22	34	75	41	47.7	2.5	126.3	0.84	0.18
00:24	33	74	41	46.7	2.7	123.1	0.70	0.18
00:26	32	73	41	45.7	2.7	121.2	0.65	0.16
00:28	33	74	41	46.7	2.7	133.3	0.57	0.25
00:30	34	75	41	47.7	2.6	133.3	0.62	0.11
00:32	35	76	41	48.7	2.5	133.3	0.60	0.15
00:34	36	77	41	49.7	2.5	133.3	0.70	0.14
00:36	37	77	40	50.3	2.1	141.2	0.57	0.12
00:38	40	85	45	55.0	2.3	141.2	0.71	0.12

d=diphasic T value

APPENDIX (**Continued.**)

	TIME	DP	SP	PP	MAP	CVP	HR	R	T
18.	00:40	43	85	42	57.0	2.0	141.2	0.57	0.12
	00:42	46	90	44	60.7	2.2	141.2	0.66	0.10
	00:44	48	92	44	62.7	2.0	150.0	0.58	0.10
	00:46	50	95	45	65.0	2.2	145.4	0.63	0.06
	00:48	51	98	47	66.7	2.5	141.2	0.57	0.10
	00:50	51	98	47	66.7	2.7	141.2	0.60	0.07
	00:52	51	101	50	66.7	2.7	141.2	0.51	0.11
	00:54	50	98	48	66.0	3.0	141.2	0.50	0.07
	00:56	51	100	49	67.3	2.7	133.3	0.46	0.07
	00:58	50	100	50	66.7	3.2	129.7	0.55	0.06
	01:00	50	100	50	66.7	3.0	129.7	0.45	0.07
	01:10	50	101	51	67.0	3.5	133.3	0.43	0.05
	01:20	50	101	51	67.0	4.0	133.3	0.40	0.03
	01:30	50	96	46	65.3	4.5	141.2	0.33	0.05
	01:40	52	100	48	68.0	5.0	160.0	0.32	0.02
	01:50	52	105	53	69.7	6.0	154.8	0.32	0.01
	02:00	51	105	54	69.0	6.0	150.0	0.37	0.01
	02:30	50	101	51	67.0	6.0	160.0	0.28	0.02
	03:00	52	101	50	68.7	5.2	160.0	0.26	0.02
	03:30	55	104	49	71.3	5.0	160.0	0.30	0.02
	04:00	56	104	48	72.0	4.5	165.5	0.31	0.02
	04:30	58	107	49	74.3	4.5	160.0	0.32	0.02
	05:00	56	105	49	72.3	4.0	165.5	0.33	0.02
	05:30	55	102	47	70.7	3.7	165.5	0.37	0.02
	06:00	55	103	48	71.0	3.2	165.5	0.37	0.02
	06:30	58	110	47	73.7	3.7	165.5	0.40	0.02
	07:00	56	106	50	72.7	3.2	165.5	0.38	0.03
	07:30	56	108	52	73.3	3.0	165.5	0.38	0.03
	08:00	58	113	55	76.3	3.0	165.5	0.40	0.03
	08:30	58	114	56	76.7	3.2	-	-	-
	09:00	57	110	53	74.7	2.9	160.0	0.46	0.04
	09:30	58	113	55	76.3	2.7	165.5	0.50	0.03
	10:00	60	117	57	79.0	2.7	160.0	0.41	0.05
	10:30	59	116	57	78.0	2.7	171.4	0.41	0.05
	11:00	57	116	59	76.7	2.7	171.4	0.42	0.05
	11:30	56	114	58	75.3	2.7	165.5	0.43	0.05
	12:00	58	118	60	78.0	2.7	165.5	0.49	0.03
	12:30	58	119	61	78.3	2.5	171.4	0.45	0.05
	13:00	57	118	61	77.3	2.6	160.0	0.43	0.05
	13:30	56	116	60	76.0	2.2	160.0	0.46	0.05
	14:00	60	122	62	80.7	2.5	165.5	0.67	0.02
	14:30	59	122	63	80.0	3.0	-	-	-
	15:00	57	121	64	78.3	2.7	165.5	0.47	0.05

APPENDIX (Continued.)

19. Female Weight=3.52 kg
Injection Time=5.5 secs Amount Injected=3.5 ml

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:00	50	95	45	65.0	5.7	145.4	0.63	0.30
00:02	50	94	44	64.7	6.0	145.4	0.65	0.35
00:04	51	95	44	65.7	7.2	145.4	0.60	0.32
00:06	51	95	44	65.7	7.7	145.4	0.60	0.35
00:08	45	90	45	60.0	8.2	129.7	0.65	0.40
00:10	41	82	41	54.7	7.7	126.3	0.91	0.50
00:12	36	72	36	48.0	8.5	120.0	1.17	0.51
00:14	33	60	27	42.0	9.0	111.6	1.25	0.56
00:16	27	51	24	35.0	10.0	104.3	1.24	0.60
00:18	25	42	17	30.7	10.0	104.3	1.19	0.62
00:20	22	39	17	27.7	10.5	100.0	1.15	0.64
00:22	22	38	16	27.3	10.4	100.0	1.12	0.65
00:24	21	38	17	26.7	10.1	98.0	1.10	0.65
00:26	21	36	15	26.0	-	98.0	1.05	0.65
00:28	21	36	15	26.0	9.5	100.0	1.09	0.70
00:30	21	36	15	26.0	9.4	100.0	1.05	0.70
00:32	21	37	16	26.3	9.0	100.0	1.03	0.74
00:34	21	37	16	26.3	8.8	102.1	1.05	0.77
00:36	22	40	18	28.0	8.8	104.3	1.05	0.75
00:38	25	46	21	32.0	8.3	109.1	1.02	0.75
00:40	25	49	24	33.0	8.0	111.6	0.95	0.75
00:42	29	56	27	38.0	8.5	114.3	0.95	0.75
00:44	30	60	30	40.0	8.4	-	-	-
00:46	32	64	32	42.7	7.5	120.0	0.89	0.75
00:48	34	66	32	44.7	7.8	117.1	0.85	0.75
00:50	36	74	38	48.7	7.6	117.1	0.85	0.67
00:52	38	75	37	50.3	7.5	120.0	0.80	0.65
00:54	40	76	36	52.0	7.5	120.0	0.77	0.60
00:56	41	80	39	54.0	7.9	120.0	0.75	0.55
00:58	42	84	42	56.0	8.0	114.3	0.74	0.52
01:00	44	85	41	57.7	8.2	114.3	0.72	0.50
01:10	48	91	43	62.3	8.8	114.3	0.65	0.42
01:20	46	91	45	61.0	9.0	111.6	0.65	0.40
01:30	46	93	47	61.7	8.5	114.3	0.60	0.35
01:40	49	94	45	64.0	9.3	120.0	0.55	0.35
01:50	50	95	45	65.0	9.2	120.0	0.52	0.40
02:00	50	95	45	65.0	8.8	120.0	0.51	0.37
02:30	56	100	44	70.7	9.1	126.3	0.50	0.32
03:00	60	105	45	75.0	8.8	126.3	0.47	0.32
03:30	61	106	45	76.0	8.2	120.0	0.50	0.30
04:00	56	100	44	70.7	8.9	120.0	0.50	0.29
04:30	60	102	42	74.0	8.9	123.1	0.50	0.30

	TIME	DP	SP	PP	MAP	CVP	HR	R	T
19.	05:00	61	102	41	74.7	8.9	126.3	0.50	0.32
	05:30	64	105	41	77.7	8.9	126.3	0.51	0.31
	06:00	65	105	40	78.3	8.5	126.3	0.52	0.33
	06:30	66	108	42	80.0	8.5	133.3	0.55	0.35
	07:00	69	111	42	83.0	8.5	129.7	0.55	0.34
	07:30	68	110	42	82.0	8.5	129.7	0.60	0.34
	08:00	70	112	42	84.0	8.0	126.3	0.57	0.30
	08:30	70	113	43	84.3	7.9	133.3	0.61	0.30
	09:00	70	115	45	85.0	7.8	137.1	0.60	0.30
	09:30	71	116	45	86.0	7.8	137.1	0.61	0.30
	10:00	74	117	43	88.3	7.5	137.1	0.61	0.30
	10:30	71	119	48	87.0	7.5	133.3	0.64	0.30
	11:00	71	117	46	86.3	7.5	141.2	0.62	0.30
	11:30	70	116	46	85.3	7.2	137.1	0.62	0.30
	12:00	70	116	46	85.3	7.0	137.1	0.64	0.34
	12:30	70	116	46	85.3	7.0	133.3	0.65	0.32
	13:00	70	119	49	86.3	7.0	137.1	0.64	0.32
	13:30	70	117	47	85.7	6.5	137.1	0.65	0.32
	14:00	70	115	45	85.0	6.5	133.3	0.67	0.32
	14:30	71	119	48	87.0	6.8	133.3	0.67	0.35
	15:00	70	115	45	85.0	6.5	133.3	0.67	0.32

20. Female Weight=3.40 kg
Injection Time=30.0 secs Amount Injected=3.4 ml

00:00	35	61	26	43.7	1.7	117.1	0.54	-0.17
00:02	35	64	29	44.7	1.7	118.5	0.56	-0.15
00:04	35	64	29	44.7	1.7	120.0	0.50	-0.15
00:06	36	65	29	45.7	2.0	120.0	0.56	-0.20
00:08	35	64	29	44.7	2.0	120.0	0.56	-0.20
00:10	33	57	24	41.0	2.2	117.1	0.56	-0.20
00:12	28	50	22	35.3	2.3	114.3	0.50	-0.21
00:14	26	45	19	32.3	2.6	117.1	0.45	-0.25
00:16	25	42	17	30.7	2.7	109.1	0.44	-0.20
00:18	24	40	16	29.3	3.0	109.1	0.40	-0.25
00:20	24	38	14	28.7	3.1	109.1	0.37	-0.26
00:22	21	36	15	26.0	3.2	109.1	0.37	-0.26
00:24	21	36	15	26.0	3.2	111.6	0.40	-0.26
00:26	21	36	15	26.0	3.5	111.6	0.39	-0.27
00:28	21	36	15	26.0	3.2	114.3	0.40	-0.27
00:30	21	36	15	26.0	3.2	114.3	0.41	-0.26
00:32	22	37	15	27.0	3.2	-	-	-
00:34	22	38	16	27.8	3.2	114.3	0.42	-0.28
00:36	21	35	14	25.7	3.5	114.3	0.40	-0.26
00:38	19	32	13	23.3	3.5	111.6	0.40	-0.26

APPENDIX (Continued)

	TIME	DP	SP	PP	MAP	CVP	HR	R	T
20.	00:40	10	30	11	22.7	3.7	111.6	0.39	-0.26
	00:42	18	30	12	22.0	3.7	111.6	0.36	-0.29
	00:44	19	30	11	22.7	3.7	114.3	0.35	-0.27
	00:46	18	30	12	22.0	3.7	114.3	0.35	-0.27
	00:48	18	31	13	22.3	3.7	109.1	0.35	-0.30
	00:50	18	32	14	22.7	3.7	111.6	0.35	-0.26
	00:52	19	34	15	24.0	3.6	111.6	0.36	-0.26
	00:54	20	34	14	24.7	3.5	111.6	0.35	-0.27
	00:56	20	35	15	25.0	3.2	111.6	0.37	-0.25
	00:58	20	37	17	25.7	3.5	111.6	0.40	-0.30
	01:00	21	37	16	26.3	3.5	111.6	0.45	-0.27
	01:10	25	42	17	30.7	3.2	111.6	0.40	-0.25
	01:20	25	45	20	31.7	3.1	109.1	0.42	-0.20
	01:30	28	46	18	34.0	3.2	111.6	0.45	-0.20
	01:40	29	49	20	35.7	3.3	111.6	0.49	-0.21
	01:50	30	50	20	36.7	3.2	111.6	0.45	-0.20
	02:00	30	51	21	37.0	3.5	109.1	0.45	-0.20
	02:30	34	55	21	41.0	3.5	109.1	0.50	-0.17
	03:00	38	62	24	46.0	3.7	114.3	0.51	-0.17
	03:30	41	67	26	49.7	3.7	111.6	0.50	-0.17
	04:00	44	70	26	52.7	3.7	109.1	0.52	-0.17
	04:30	47	75	28	56.3	4.0	109.1	0.51	-0.17
	05:00	49	77	28	58.3	3.7	109.1	0.50	-0.16
	05:30	50	77	27	59.0	3.5	109.1	0.50	-0.15
	06:00	51	80	29	60.7	3.5	109.1	0.55	-0.16
	06:30	50	80	30	60.0	3.6	109.1	0.54	-0.16
	07:00	50	80	30	60.0	3.5	109.1	0.55	-0.15
	07:30	50	79	29	59.7	3.2	109.1	0.56	-0.15
	08:00	50	80	30	60.0	3.5	-	-	-
	08:30	51	81	30	61.0	3.0	109.1	0.56	-0.16
	09:00	51	81	30	61.0	2.7	109.1	0.55	-0.11
	09:30	51	81	30	61.0	3.0	109.1	0.55	-0.15
	10:00	51	81	30	61.0	2.7	109.1	0.52	-0.14
	10:30	50	80	30	60.0	2.5	109.1	0.55	-0.15
	11:00	51	81	30	61.0	3.0	109.1	0.60	-0.15
	11:30	52	83	31	62.3	2.5	109.1	0.55	-0.15
	12:00	51	81	30	61.0	2.5	109.1	0.52	-0.12
	12:30	53	83	30	63.0	2.7	109.1	0.55	-0.14
	13:00	52	80	28	61.3	2.5	109.1	0.50	-0.12
	13:30	50	79	29	59.7	2.5	106.7	0.60	-0.15
	14:00	50	80	30	60.0	2.5	106.7	0.56	-0.15
	14:30	50	78	28	59.3	2.5	109.1	0.56	-0.15
	15:00	50	76	26	58.7	2.2	109.1	0.51	-0.12

21. Female Weight=3.25 kg
Injection Time=15.0 secs Amount Injected=3.2 ml

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:00	65	94	29	74.7	0.7	171.4	0.28	0.03
00:02	65	96	31	75.3	1.2	171.4	0.25	0.01
00:04	65	95	30	75,0	1.2	171.4	0.20	0.08
00:06	67	98	31	77.3	1.7	171.4	0.37	0.01
00:08	66	97	31	76.3	2.5	-	-	-
00: 10	64	94	30	74.0	3.0	171.4	0.35	0.02
00: 12	55	85	30	65.0	3.2	171.4	0.35	0.03
00: 14	50	75	25	58.3	3.7	171.4	0.36	0.05
00: 16	43	68	25	51.3	4.2	171.4	0.27	0.07
00: 18	40	62	22	47.3	4.9	171.4	0.40	0.08
00: 20	35	55	20	41.7	6.0	165.5	0.37	0.08
00: 22	34	51	17	39.7	6.7	165.5	0.37	0.10
00: 24	28	45	17	33.7	7.5	162.2	0.36	0.10
00: 26	27	45	18	33.0	8.0	162.2	0.32	0.13
00: 28	31	46	15	36.0	8.5	160.0	0.30	0.12
00:30	33	49	16	38.3	8.6	160.0	0.27	0.15
00:32	35	50	15	40.0	8.5	160.0	0.25	0.15
00:34	36	54	18	42.0	8.7	160.0	0.25	0.17
00:36	38	54	16	43.3	8.7	160.0	0.22	0.17
00:38	40	55	15	45.0	8.7	160.0	0.22	0.19
00:40	43	56	13	47.3	8.2	160.0	0.24	0.18
00:42	44	58	14	48.7	8.2	160.0	0.25	0.17
00:44	45	62	17	50.7	8.0	160.0	0.25	0.16
00:46	46	65	19	52.3	8.0	160.0	0.25	0.15
00:48	48	66	18	54.0	7.8	160.0	0.27	0.15
00:50	50	70	20	56.7	7.7	160.0	0.27	0.14
00:52	51	72	21	58.0	7.7	160.0	0.27	0.11
00:54	52	75	23	59.7	8.0	160.0	0.31	0.12
00:56	53	75	22	60.3	7.6	160.0	0.31	0.12
00:58	55	76	21	61.0	7.7	154.8	0.31	0.12
01:00	55	76	21	62.0	7.7	154.8	0.32	0.11
01:10	52	75	23	59.7	7.7	160.0	0.26	0.10
01:20	50	70	20	56.7	8.0	160.0	0.22	0.10
01:30	47	70	23	54.7	8.2	160.0	0.22	0.07
01:40	45	67	22	52.3	8.2	154.8	0.17	0.06
01:50	44	66	22	51.3	8.1	160.0	0.18	0.05
02:00	45	65	20	51.7	7.5	160.0	0.15	0.05
02:30	45	62	17	50.7	7.5	150.0	0.17	0.04
03:00	45	65	20	51.7	7.0	150.0	0.15	0.03
03:30	42	66	24	50.0	6.2	150.0	0.18	0.03
04:00	44	70	26	52.7	5.5	150.0	0.20	0.03
04:30	49	78	29	58.7	5.2	154.8	0.20	0.03

22.

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:42	39	75	36	51.0	3.0	117.1	0.43	-0.12
00:44	40	75	35	51.7	3.1	117.1	0.39	-0.15
00:46	40	75	35	51.7	3.2	114.3	0.43	-0.12
00:48	40	75	35	51.7	3.2	120.0	0.45	-0.14
00:50	40	75	35	51.7	3.5	117.1	0.43	-0.12
00:52	40	75	35	51.7	3.6	114.3	0.45	-0.12
00:54	40	75	35	51.7	3.6	120.0	0.45	-0.15
00:56	40	75	35	51.7	3.7	120.0	0.43	-0.12
00:58	40	75	35	51.7	3.8	114.3	0.44	-0.12
01:00	40	75	35	51.7	4.0	114.3	0.43	-0.13
01:10	40	76	36	52.0	4.5	114.3	0.45	-0.12
01:20	38	75	37	50.3	5.0	114.3	0.42	-0.09
01:30	40	76	36	52.0	5.5	109.1	0.42	-0.11
01:40	40	78	38	52.7	5.7	106.7	0.41	-0.09
01:50	41	78	37	53.3	5.8	111.6	0.39	-0.07
02:00	55	80	25	63.3	5.7	111.6	0.42	-0.08
02:30	41	85	44	55.7	5.7	114.3	0.42	-0.08
03:00	45	90	45	60.0	6.5	114.3	0.45	-0.08
03:30	50	96	46	65.3	6.2	120.0	0.46	-0.08
04:00	50	96	46	65.3	6.5	117.1	0.43	-0.10
04:30	52	100	48	68.0	6.0	120.0	0.46	-0.09
05:00	53	101	48	69.0	6.2	120.0	0.42	-0.11
05:30	51	101	50	67.7	5.7	120.0	0.48	-0.09
06:00	55	103	48	71.0	5.9	120.0	0.48	-0.12
06:30	54	104	50	70.7	6.0	120.0	0.49	-0.09
07:00	55	104	49	71.3	5.4	123.1	0.48	-0.09
07:30	55	102	47	70.7	5.2	123.1	0.49	-0.09
08:00	60	105	45	75.0	5.0	126.3	0.48	-0.09
08:30	64	106	42	78.0	5.0	133.3	0.49	-0.09
09:00	59	104	45	74.0	4.7	129.7	0.49	-0.11
09:30	60	105	45	75.0	4.6	129.7	0.50	-0.09
10:00	58	104	46	73.3	4.5	129.7	0.51	-0.09
10:30	60	104	44	74.7	4.6	126.3	0.48	-0.11
11:00	63	103	40	76.3	4.5	129.7	0.49	-0.09
11:30	63	103	40	76.3	4.2	133.3	0.50	-0.10
12:00	73	102	29	82.7	4.2	126.3	0.49	-0.12
12:30	50	95	45	65.0	4.3	126.3	0.49	-0.10
13:00	50	95	45	65.0	4.0	133.3	0.50	-0.10
13:30	50	95	45	65.0	4.0	133.3	0.51	-0.10
14:00	50	96	46	65.3	4.0	133.3	0.49	-0.12
14:30	50	100	50	66.7	3.9	133.3	0.49	-0.12
15:00	55	103	48	71.0	3.9	137.1	0.49	-0.10

APPENDIX (Continued.)

23. Female Weight=3.15 kg
Injection Time=6.5 secs Amount Injected=3.1 ml

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:00	42	75	33	53.0	2.0	141.2	0.56	-0.04
00:02	42	75	33	53.0	2.6	141.2	0.56	-0.03
00:04	43	76	33	54.0	3.6	141.2	0.56	-0.04
00:06	43	76	33	54.0	4.2	-	0.58	-0.04
00:08	42	75	33	53.0	4.5	141.2	0.56	-0.04
00:10	40	71	31	50.3	4.6	137.1	0.52	-0.04**
00:12	38	69	31	48.3	4.5	126.3	0.53	-0.06**
00:14	38	65	27	47.0	4.1	137.1	0.56	-0.09**
00:16	38	65	27	47.0	4.0	137.1	0.56	-0.10**
00:18	35	58	23	42.7	4.1	137.1	0.50	-0.11**
00:20	33	51	18	39.0	4.2	133.3	0.44	-0.09**
00:22	30	46	16	35.3	4.2	133.3	0.40	-0.09**
00:24	28	43	15	33.0	5.5	133.3	0.36	-0.08**
00:26	26	40	14	30.7	6.0	133.3	0.31	-0.05**
00:28	26	39	13	30.3	6.2	126.3	0.30	-0.05**
00:30	26	39	13	30.3	6.2	133.3	0.27	-0.04**
00:32	26	38	12	30.0	6.2	133.3	0.27	-0.02**
00:34	26	39	13	30.3	6.1	-	0.23	-
00:36	29	40	11	32.7	6.2	126.3	0.27	-0.01**
00:38	30	41	11	33.7	6.1	133.3	0.26	-0.02**
00:40	31	45	14	35.7	6.0	133.3	0.27	-0.02**
00:42	34	49	15	39.0	5.0	133.3	0.30	-0.03**
00:44	35	50	15	40.0	5.0	133.3	0.31	-0.02**
00:46	36	54	18	42.0	4.7	133.3	0.30	-0.04**
00:48	40	59	19	46.3	4.5	133.3	0.35	-0.04**
00:50	41	60	19	47.3	4.2	133.3	0.37	-0.04**
00:52	44	65	21	51.0	4.0	133.3	0.39	-0.04**
00:54	45	66	21	52.0	4.2	129.7	0.43	-0.04**
00:56	46	70	24	54.0	4.0	126.3	0.43	-0.03**
00:58	49	71	22	56.3	4.0	129.7	0.48	-0.03**
01:00	50	72	22	57.3	4.0	129.7	0.48	-0.02**
01:10	50	75	25	58.3	4.6	126.3	0.53	-0.04**
01:20	50	74	24	58.0	5.0	126.3	0.56	-0.05**
01:30	45	70	25	53.3	5.0	123.1	0.58	-0.08**
01:40	45	70	25	53.3	5.0	123.1	0.56	-0.07**
01:50	45	70	25	53.3	5.5	123.1	0.61	-0.09**
02:00	45	72	27	54.0	6.0	126.3	0.61	-0.09**
02:30	41	71	30	51.0	5.5	126.3	0.61	-0.07**
03:00	40	74	34	51.3	5.2	120.0	0.61	-0.05**
03:30	43	75	32	53.7	5.2	126.3	0.62	-0.07**
04:00	43	75	32	53.7	4.9	126.3	0.64	-0.06**
04:30	45	79	34	56.3	4.7	123.1	0.65	-0.06**

**Elevated S-T segment

23.

TIME	DP	SP	PP	MAP	CVP	HR	R	T
05:00	45	76	31	55.3	4.2	123.1	0.61	-0.03**
05:30	45	82	37	57.3	4.0	123.1	0.62	-0.04**
06:00	46	82	36	58.0	4.0	126.3	0.61	-0.03**
06:30	49	85	36	61.0	3.7	123.1	0.61	-0.02**
07:00	49	85	36	61.0	3.7	126.3	0.61	-0.03**
07:30	50	86	36	62.0	3.5	120.0	0.64	-0.02**
08:00	50	89	39	63.0	3.0	123.1	0.63	-0.03**
08:30	50	89	39	63.0	3.0	123.1	0.63	-0.04**
09:00	50	90	40	63.3	2.9	123.1	0.63	-0.04**
09:30	50	90	40	63.3	2.7	123.1	0.62	-0.04**
10:00	50	90	40	63.3	2.7	126.3	0.61	-0.04**
10:30	50	91	41	63.7	2.5	123.1	0.61	-0.04**
11:00	50	91	41	63.7	2.5	126.3	0.65	-0.03**
11:30	50	93	43	64.3	2.5	126.3	0.65	-0.04**
12:00	50	94	44	64.7	2.5	126.3	0.66	-0.04**
12:30	52	95	45	67.0	2.5	123.1	0.65	-0.03**
13:00	50	94	44	64.7	2.5	123.1	0.65	-0.04**
13:30	51	95	44	65.7	2.5	123.1	0.65	-0.03**
14:00	51	94	43	65.3	2.0	-	-	-
14:30	50	94	44	64.7	1.9	-	-	-
15:00	50	90	40	63.3	2.1	126.3	0.56	-0.03**

24. Female Weight=2.85 kg
Injection Time=14.5 secs Amount Injected=2.8 ml

00:00	35	57	22	42.3	1.0	154.8	0.03	0.24
00:02	35	58	23	42.7	1.2	150.0	0.08	0.20
00:04	35	58	23	42.7	1.5	154.8	0.08	0.22
00:06	36	60	24	44.0	1.5	150.0	0.05	0.23
00:08	37	63	26	45.7	1.7	154.8	0.08	0.22
00:10	36	60	24	44.0	2.0	150.0	0.03	0.23
00:12	34	56	22	41.3	2.0	145.4	0.05	0.27
00:14	32	52	20	38.7	2.0	141.2	0.16	0.31
00:16	30	49	19	36.3	2.2	137.1	0.20	0.37
00:18	27	45	18	33.0	2.2	137.1	0.30	0.38
00:20	26	41	15	31.0	2.5	133.3	0.38	0.41
00:22	25	39	14	29.7	2.7	126.3	0.40	0.41
00:24	35	35	11	27.7	2.7	126.3	0.42	0.43
00:26	21	34	13	25.3	3.2	126.3	0.40	0.43
00:28	20	33	13	24.3	3.5	123.1	0.38	0.46
00:30	20	31	11	23.7	3.2	121.2	0.36	0.48
00:32	19	30	11	22.7	3.2	121.2	0.36	0.48
00:34	18	27	9	21.0	3.4	120.0	0.35	0.48
00:36	17	27	10	20.3	3.5	120.0	0.35	0.50
00:38	17	26	9	20.0	3.7	120.0	0.35	0.51

**Elevated. S-T segment

24.

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:40	17	25	8	19.7	4.7	121.2	0.36	0.50
00:42	18	26	8	20.7	4.4	123.1	0.37	0.50
00:44	18	27	9	21.0	3.5	123.1	0.35	0.51
00:46	18	27	9	21.0	3.7	121.2	0.35	0.48
00:48	19	30	11	22.7	3.6	123.1	0.32	0.51
00:50	19	30	11	22.7	3.0	126.3	0.30	0.50
00:52	20	31	11	23.7	3.5	126.3	0.31	0.48
00:54	20	32	12	24.0	3.0	126.3	0.27	0.48
00:56	20	32	12	24.0	3.2	126.3	0.27	0.45
00:58	21	34	13	25.3	2.7	126.3	0.23	0.46
01:00	21	34	13	25.3	3.0	126.3	0.25	0.47
01:10	25	38	13	29.3	2.7	126.3	0.21	0.41
01:20	26	41	15	31.0	2.7	129.7	0.16	0.37
01:30	27	43	16	32.3	3.0	129.7	0.17	0.33
01:40	30	46	16	35.3	2.7	129.7	0.15	0.28
01:50	32	49	17	37.7	3.0	129.7	0.13	0.26
02:00	34	52	18	40.0	2.7	129.7	0.13	0.21
02:30	38	60	22	45.3	2.7	129.7	0.11	0.18
03:00	43	66	23	50.7	2.7	126.3	0.11	0.16
03:30	46	72	26	54.7	2.5	129.7	0.10	0.16
04:00	51	77	26	59.7	2.2	129.7	0.08	0.16
04:30	53	80	27	62.0	2.2	129.7	0.08	0.16
05:00	55	83	28	64.3	1.8	126.3	0.10	0.17
05:30	63	86	23	70.7	1.7	126.3	0.08	0.17
06:00	61	84	23	68.7	1.7	126.3	0.09	0.17
06:30	61	84	23	68.7	1.7	129.7	0.10	0.17
07:00	65	92	27	74.0	1.7	129.7	0.08	0.16
07:30	67	95	28	76.3	1.7	129.7	0.07	0.16
08:00	69	96	27	78.0	1.5	133.3	0.08	0.16
08:30	71	98	27	80.0	1.5	129.7	0.07	0.17
09:00	74	100	26	82.7	1.6	129.7	0.08	0.18
09:30	74	100	26	82.7	1.5	133.3	0.08	0.20
10:00	75	101	26	83.7	1.2	133.3	0.07	0.20
10:30	78	104	26	86.7	1.7	133.3	0.07	0.21
11:00	78	104	26	86.7	1.5	137.1	0.07	0.21
11:30	79	105	26	87.7	1.4	133.3	0.07	0.21
12:00	80	106	26	88.7	1.2	133.3	0.07	0.21
12:30	80	106	26	88.7	1.2	133.3	0.07	0.20
13:00	82	108	26	90.7	1.2	133.3	0.07	0.20
13:30	81	107	26	89.7	1.2	133.3	0.07	0.22
14:00	82	109	27	91.0	1.2	133.3	0.07	0.21
14:30	83	110	27	92.0	1.0	133.3	0.07	0.22
15:00	82	110	28	91.3	1.5	133.3	0.07	0.22

APPENDIX (Continued.)

25. Female Weight=2.78 kg
Injection Time=12.0 secs Amount Injected=2.8 ml

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:00	77	138	61	97.3	-0.5	200.0	0.36	0.21
00:02	77	133	56	95.7	0.2	200.0	0.36	0.21
00:04	77	138	61	97.3	1.1	200.0	0.31	0.21
00:06	76	140	64	97.3	0.9	200.0	0.39	0.22
00:08	72	128	56	90.7	1.9	200.0	0.45	0.22
00:10	73	129	56	91.7	1.5	200.0	0.42	0.21
00:12	74	130	56	92.7	2.0	200.0	0.48	0.21
00:14	70	128	58	89.3	2.6	200.0	0.54	0.21
00:16	69	126	57	88.0	2.9	200.0	0.64	0.21
00:18	68	126	58	87.3	2.7	200.0	0.63	0.21
00:20	72	133	61	92.3	2.5	200.0	0.64	0.22
00:22	70	130	60	90.0	2.6	200.0	0.63	0.25
00:24	70	132	62	90.7	2.5	200.0	0.63	0.25
00:26	70	134	64	91.3	2.2	200.0	0.61	0.24
00:28	73	141	68	95.7	2.7	184.6	0.66	0.24
00:30	72	140	68	94.7	2.2	184.6	0.64	0.24
00:32	73	143	70	96.3	2.7	184.6	0.63	0.22
00:34	81	145	64	102.3	2.7	184.6	0.63	0.27
00:36	79	146	67	101.3	3.2	184.6	0.61	0.24
00:38	82	150	68	104.7	3.1	177.8	0.60	0.24
00:40	86	152	66	108.0	3.0	177.8	0.57	0.24
00:42	88	155	67	110.3	3.0	184.6	0.57	0.24
00:44	90	154	64	111.3	3.4	177.8	0.55	0.25
00:46	92	152	60	112.0	3.1	177.8	0.57	0.25
00:48	93	153	60	113.0	3.2	177.8	0.54	0.25
00:50	92	151	59	111.7	3.7	177.8	0.54	0.25
00:52	92	151	59	111.7	3.2	177.8	0.48	0.24
00:54	93	150	57	112.0	3.5	177.8	0.48	0.26
00:56	93	152	59	112.7	3.5	184.6	0.46	0.24
00:58	92	150	58	111.3	3.5	184.6	0.45	0.22
01:00	88	150	62	108.7	3.7	181.1	-	0.24
01:10	95	154	59	114.7	3.6	184.6	0.42	0.24
01:20	95	154	59	114.7	3.6	184.6	0.48	0.24
01:30	94	150	56	112.7	3.4	184.6	0.38	0.21
01:40	94	150	56	112.7	-	184.6	0.46	0.24
01:50	89	147	58	108.3	3.6	184.6	0.40	0.24
02:00	90	148	58	109.3	3.4	181.1	0.37	0.22
02:30	88	143	55	106.3	2.9	184.6	0.34	0.21
03:00	93	146	53	110.7	3.5	184.6	0.37	0.22
03:30	93	145	52	110.3	3.7	177.8	0.39	0.22
04:00	90	139	49	106.3	3.1	181.1	0.33	0.22
04:30	89	135	46	104.3	2.9	184.6	0.33	0.22

APPENDIX (Continued.)

25.

TIME	DP	SP	PP	MAP	CVP	HR	R	T
05:00	88	137	49	104.3	3.1	184.6	0.33	0.22
05:30	88	135	47	103.7	3.5	177.8	0.36	0.21
06:00	86	135	49	102.3	3.1	184.6	0.36	0.22
06:30	85	137	52	102.3	3.1	184.6	0.36	0.21
07:00	87	143	56	105.7	4.2	-	-	-
07:30	85	147	62	105.7	4.7	-	-	-
08:00	83	145	62	103.7	4.6	184.6	0.33	0.19
08:30	82	146	64	103.3	4.6	184.6	0.33	0.18
09:00	79	150	71	102.7	4.5	184.6	0.34	0.16
09:30	78	149	71	101.7	4.0	184.6	0.28	0.15
10:00	75	145	70	98.3	4.4	184.6	0.33	0.16
10:30	77	150	73	101.3	3.8	184.6	0.28	0.15
11:00	76	149	73	100.3	3.2	184.6	0.27	0.15
11:30	77	149	72	101.0	3.1	192.0	0.28	0.15
12:00	77	146	69	100.0	3.4	184.6	0.30	0.15
12:30	77	143	66	99.0	2.7	184.6	0.31	0.16
13:00	78	144	66	100.0	3.0	192.0	0.25	0.15
13:30	81	147	66	103.0	2.9	192.0	0.28	0.15
14:00	83	145	62	103.7	2.4	184.6	0.28	0.16
14:30	79	140	61	99.3	2.6	184.6	0.28	0.16
15:00	83	144	61	103.3	3.7	184.6	0.33	0.18

26. Female Weight=2.70 kg
Injection Time=8.0 secs Amount Injected=2.7 ml

00:00	74	100	26	82.7	1.7	133.3	0.37	0.02
00:02	75	100	25	83.3	2.7	133.3	0.42	0.02
00:04	75	100	25	83.3	3.2	133.3	0.39	0.01
00:06	76	101	25	84.3	3.5	133.3	0.42	0.00
00:08	71	99	28	80.3	3.6	133.3	0.45	0.02
00:10	65	92	27	74.0	3.7	133.3	0.50	0.01**
00:12	61	87	26	69.7	3.7	133.3	0.55	0.03**
00:14	55	82	27	64.0	4.2	133.3	0.60	0.02**
00:16	49	75	26	57.7	4.4	133.3	0.60	0.03**
00:18	43	70	27	52.0	4.5	133.3	0.56	0.02**
00:20	41	66	25	49.3	4.5	133.3	0.60	0.01**
00:22	40	65	25	48.3	4.5	133.3	0.57	0.02**
00:24	39	64	25	47.3	4.1	-	-	-
00:26	40	64	24	48.0	4.0	126.3	0.55	0.01**
00:28	40	65	25	48.3	3.7	129.7	0.52	0.01**
00:30	41	66	25	49.3	3.6	129.7	0.55	0.01**
00:32	42	69	27	51.0	3.7	129.7	0.60	0.01**
00:34	44	68	24	52.0	3.2	129.7	0.55	0.01**
00:36	45	73	28	54.3	3.5	129.7	0.65	0.00**
00:38	47	74	27	56.0	3.0	126.3	0.55	0.01**

**Elevated S-T segment

APPENDIX (Continued)

26.

TIME	DP	SP	PP	MAP	CVP	HR	R	T	
00:40	50	77	27	59.0	3.2	129.7	0.60	0.01	**
00:42	54	80	26	62.7	3.2	129.7	0.50	0.01	**
00:44	57	83	26	65.7	3.2	129.7	0.55	0.01	**
00:46	60	85	25	68.3	3.5	126.3	0.50	0.01	**
00:48	63	87	24	71.0	3.1	126.3	0.50	0.01	**
00:50	65	91	26	73.7	3.5	126.3	0.60	0.00	**
00:52	66	92	26	74.7	3.5	126.3	0.50	0.01	**
00:54	69	95	26	77.7	3.7	126.3	0.55	0.01	**
00:56	70	95	25	78.3	3.7	126.3	0.47	0.01	**
00:58	72	97	25	80.3	4.2	129.7	0.51	0.01	**
01:00	72	97	25	80.3	4.2	129.7	0.45	0.01	**
01:10	77	101	24	85.0	5.2	126.3	0.51	0.01	**
01:20	80	103	23	87.7	5.5	126.3	0.47	0.02	**
01:30	79	104	25	87.3	6.5	123.1	0.45	0.02	**
01:40	77	104	27	86.0	6.0	123.1	0.48	0.01	**
01:50	74	100	26	82.7	6.0	123.1	0.42	0.02	**
02:00	71	100	29	80.7	6.5	120.0	0.32	0.01	**
02:30	71	100	29	80.7	6.0	123.1	0.35	0.02	**
03:00	70	100	30	80.0	6.0	126.3	0.28	0.02	**
03:30	71	101	30	81.0	5.2	120.0	0.32	0.01	**
04:00	72	102	30	82.0	5.0	120.0	0.32	0.02	**
04:30	74	104	30	84.0	4.7	120.0	0.37	0.02	**
05:00	77	106	29	86.7	4.7	120.0	0.36	0.02	**
05:30	75	105	30	85.0	4.2	120.0	0.34	0.01	**
06:00	74	108	34	85.3	4.0	120.0	0.35	0.02	
06:30	79	109	30	89.0	3.7	120.0	0.40	0.03	
07:00	83	111	28	92.3	3.9	123.1	0.45	0.02	
07:30	80	110	30	90.0	3.0	123.1	0.35	0.03	
08:00	80	113	33	91.0	3.6	120.0	0.42	0.05	
08:30	83	111	28	92.3	2.7	120.0	0.35	0.04	
09:00	85	115	30	95.0	3.2	120.0	0.37	0.05	
09:30	85	115	30	95.0	3.0	120.0	0.40	0.05	
10:00	87	116	29	96.7	2.6	120.0	0.35	0.05	
10:30	89	118	29	98.7	3.2	120.0	0.40	-0.06	
11:00	86	116	30	96.0	2.6	120.0	0.47	0.04	
11:30	88	118	30	98.0	3.0	120.0	0.39	0.05	
12:00	85	115	30	95.0	2.5	120.0	0.37	0.07	
12:30	90	118	28	99.3	2.0	120.0	0.41	0.06	
13:00	87	117	30	97.0	2.2	120.0	0.40	0.07	
13:30	89	118	29	98.7	2.2	120.0	0.40	0.06	
14:00	87	117	30	97.0	1.7	120.0	0.42	0.05	
14:30	90	119	29	99.7	2.2	120.0	0.45	0.05	
15:00	89	119	30	99.0	2.0	120.0	0.40	0.05	

**Elevated S-T segment

27. Female Weight=2.60 kg
Injection Time=8.5 secs Amount Injected=2.6 ml

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:00	60	100	40	73.3	2.5	150.0	0.63	-0.30
00:02	60	100	40	73.3	2.5	150.0	0.60	-0.29
00:04	61	103	42	75.0	3.0	150.0	0.66	-0.32
00:06	60	101	41	73.7	4.2	150.0	0.66	-0.33
00:08	58	100	42	72.0	4.5	150.0	0.60	-0.33
00: 10	55	96	41	68.7	3.2	150.0	0.57	-0.33
00: 12	54	93	39	67.0	3.5	150.0	0.51	-0.33
00: 14	50	89	39	63.0	3.5	150.0	0.51	-0.36
00: 16	48	85	37	60.3	4.0	150.0	0.51	-0.33
00: 18	45	80	35	56.7	4.2	150.0	0.45	-0.33
00: 20	44	79	35	55.7	4.2	150.0	0.46	-0.33
00: 22	44	80	36	56.0	4.2	150.0	0.48	-0.33
00:24	45	82	37	57.3	4.0	150.0	0.60	-0.34
00: 26	45	82	37	57.3	3.5	150.0	0.66	-0.36
00: 28	45	82	37	57.3	3.2	150.0	0.62	-0.36
00:30	45	84	39	58.0	3.0	150.0	0.63	-0.33
00:32	45	85	40	58.3	2.7	150.0	0.69	-0.27
00:34	46	85	39	59.0	2.7	150.0	0.70	-0.24
00: 36	46	85	39	59.0	2.7	154.8	0.64	-0.24
00:38	46	85	39	59.0	2.7	150.0	0.66	-0.24
00:40	48	88	40	61.3	2.7	150.0	0.70	-0.26
00: 42	50	90	40	63.3	3.0	150.0	0.76	-0.18
00:44	50	90	40	63.3	2.5	150.0	0.67	-0.30
00:46	50	90	40	63.3	3.0	154.8	0.63	-0.24
00:48	50	91	41	63.7	3.0	160.0	0.71	-0.27
00: 50	51	93	42	65.0	3.2	154.8	0.70	-0.24
00: 52	51	93	42	65.0	3.2	154.8	0.69	-0.24
00:54	51	93	42	65.0	3.3	150.0	0.67	-0.24
00:56	52	94	42	66.0	3.2	150.0	0.70	-0.25
00:58	52	95	43	66.3	3.2	150.0	0.72	-0.27
01:00	52	95	43	66.3	3.7	150.0	0.72	-0.25
01: 10	53	95	42	67.0	4.0	150.0	0.73	-0.28
01:20	55	100	45	70.0	4.2	150.0	0.70	-0.27
01:30	55	100	45	70.0	5.2	150.0	0.66	-0.24
01:40	55	101	46	70.3	4.7	150.0	0.67	-0.21
01:50	56	102	46	71.3	4.5	150.0	0.69	-0.25
02:00	57	104	47	72.7	4.7	150.0	0.64	-0.21
02: 30	59	106	47	74.2	4.7	150.0	0.63	-0.25
03:00	57	106	49	73.3	4.5	150.0	0.54	-0.21
03: 30	58	105	47	73.7	4.5	150.0	0.60	-0.21
04:00	57	105	48	73.0	4.5	150.0	0.60	-0.21
04: 30	55	102	47	70.7	4.5	150.0	0.60	-0.21

APPENDIX (Continued)

27.

TIME	DP	SP	PP	MAP	CVP	HR	R	T
05:00	55	100	45	70.0	4.0	150.0	0.60	-0.24
05:30	55	100	45	70.0	4.5	150.0	0.60	-0.18
06:00	53	96	43	67.3	4.2	150.0	0.75	-0.27
06:30	52	95	43	66.3	4.2	150.0	0.57	-0.24
07:00	52	95	43	66.3	4.2	150.0	0.58	-0.27
07:30	51	93	42	65.0	4.2	150.0	0.56	-0.24
08:00	50	92	42	64.0	4.0	150.0	0.54	-0.27
08:30	50	91	41	63.7	4.2	150.0	0.57	-0.30
09:00	50	91	41	63.7	4.0	150.0	0.61	-0.18
09:30	50	89	39	63.0	4.0	150.0	0.54	-0.27
10:00	50	90	40	63.3	4.2	150.0	0.51	-0.24
10:30	50	90	40	63.3	4.2	150.0	0.57	-0.30
11:00	50	90	40	63.3	4.0	150.0	0.54	-0.24
11:30	50	90	40	63.3	4.2	150.0	0.51	-0.33
12:00	50	90	40	3 3	4.0		0.51	-0.30
12:30	49	88	39	62.0	4.2	150.0	0.51	-0.28
13:00	48	89	41	61.7	4.0	150.0	0.46	-0.36
13:30	49	89	40	62.3	4.0	150.0	0.52	-0.36
14:00	46	87	41	59.7	4.5	150.0	0.48	-0.31
14:30	45	87	42	59.0	4.4	150.0	0.48	-0.33
15:00	45	87	42	59.0	4.2	150.0	0.42	-0.39

28. Male Weight=2.58 kg
Injection Time=5.5 secs Amount Injected=2.6 ml

00:00	50	90	40	63.3	1.5	133.3	0.41	0.04d
00:02	50	90	40	63.3	2.5	133.3	0.37	0.04d
00:04	53	88	35	64.7	3.0	133.3	0.48	0.04d
00:06	54	92	38	66.7	2.5	133.3	0.40	0.03d
00:08	53	90	37	65.3	2.5	137.1	0.46	-0.05d*
00:10	54	90	36	66.0	2.2	137.1	0.49	-0.11d*
00:12	50	82	32	60.7	2.2	137.1	0.54	-0.07d*
00:14	44	77	33	55.0	2.5	133.3	0.49	-0.05d*
00:16	40	74	34	51.3	3.0	137.1	0.46	-0.04d*
00:18	38	70	32	48.7	3.0	133.3	0.48	±0.03d*
00:20	37	70	33	48.0	3.0	133.3	0.48	±0.03d*
00:22	37	69	32	47.7	3.0	133.3	0.46	0.03*
00:24	38	71	33	49.0	2.7	133.3	0.44	0.02*
00:26	39	72	33	50.0	2.5	129.7	0.42	0.04*
00:28	40	75	35	51.7	2.5	133.3	0.56	-0.05d*
00:30	41	75	34	52.3	2.0	133.3	0.44	0.04*
00:32	43	80	37	55.3	1.8	133.3	0.53	0.04*
00:34	45	80	35	56.7	1.7	133.3	0.44	0.03*
00:36	45	84	39	58.0	1.7	133.3	0.48	±0.02*
00:38	46	85	39	59.0	1.7	133.3	0.43	±0.01d*

d=diphasic T value
"Depressed S-T segment

28.

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:40	46	84	38	58.7	1.7	133.3	0.39	0.03*
00:42	49	85	36	61.0	2.0	133.3	0.39	0.03*
00:44	50	87	37	62.3	2.0	133.3	0.40	0.03*
00:46	50	89	39	63.0	1.6	133.3	0.42	0.03*
00:48	50	90	40	63.3	2.2	137.1	0.48	0.03*
00:50	50	89	39	63.0	2.2	137.1	0.36	0.03*
00:52	50	90	40	63.3	2.0	133.3	0.34	0.02*
00:54	51	91	40	64.3	2.5	133.3	0.44	0.03*
00:56	52	91	39	65.0	2.5	133.3	0.36	0.03*
00:58	52	94	42	66.0	2.5	133.3	0.42	±0.02d*
01:00	52	93	41	65.7	2.7	133.3	0.35	0.03d*
01:10	54	95	41	67.7	3.5	133.3	0.36	±0.03d*
01:20	54	95	41	67.7	3.6	133.3	0.31	±0.02d*
01:30	52	96	44	66.7	3.5	133.3	0.30	0.04d*
01:40	51	94	43	65.3	3.5	133.3	0.25	0.03d*
01:50	52	95	43	66.3	4.0	133.3	0.24	±0.03d*
02:00	56	98	42	70.0	4.2	133.3	0.32	0.04d*
02:30	60	99	39	73.0	3.5	133.3	0.24	±0.02d*
03:00	65	102	37	77.3	4.2	133.3	0.25	±0.02d*
03:30	64	102	38	76.7	4.0	133.3	0.29	-0.03d*
04:00	66	105	39	79.0	4.2	133.3	0.31	-0.04d*
04:30	65	105	40	78.3	4.4	133.3	0.34	-0.04d*
05:00	66	105	39	79.0	3.7	133.3	0.38	-0.04"
05:30	70	107	37	82.3	4.2	133.3	0.30	-0.02d*
06:00	69	106	37	81.3	3.5	133.3	0.39	∓0.04d*
06:30	71	108	37	83.3	4.0	133.3	0.34	±0.02d*
07:00	70	105	35	81.7	4.2	133.3	0.35	±0.01d*
07:30	74	109	35	85.7	3.9	129.7	0.35	+ -0.0 1d*
08:00	72	109	37	84.3	4.4	126.3	0.38	0.026"
08:30	64	101	37	76.3	4.7	126.3	0.34	0.02d**
09:00	65	100	35	76.7	4.5	126.3	0.38	0.02d**
09:30	65	100	35	76.7	5.0	126.3	0.42	±0.01d**
10:00	65	100	35	76.7	4.9	126.3	0.43	-0.02d**
10:30	66	99	33	77.0	4.6	126.3	0.36	-0.01 d**
11:00	65	99	34	76.3	4.5	126.3	0.44	∓0.02d**
11:30	65	99	34	76.3	4.8	126.3	0.39	∓0.0 1d**
12:00	65	99	34	76.3	4.5	126.3	0.39	-0.0 1d**
12:30	64	100	36	76.0	4.7	126.3	0.46	0.02d**
13:00	63	98	35	74.7	4.5	129.7	0.44	∓0.02d**
13:30	61	96	35	72.7	4.7	126.3	0.38	-0.01d**
14:00	72	105	33	83.0	4.0	126.3	0.44	∓0.02d**
14:30	70	107	37	82.3	4.0	126.3	0.42	-0.01d**
15:00	70	108	38	82.7	4.2	129.7	0.40	

d=Diphasic T value
*Depressed S-T segment
**Elevated S-T segment

29. Male Weight=2.37 kg
Injection Time=5.5 secs Amount Injected=

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:00	80	116	36	92.0	4.9	192.0	0.10	0.00
00:02	81	117	36	93.0	6.0	192.0	0.11	0.00
00:04	84	119	35	95.7	6.7	192.0	0.12	0.00
00:06	76	112	36	88.0	6.7	200.0	0.12	0.00
00:08	68	102	34	79.3	7.1	192.0	0.14	0.00
00:10	55	87	32	65.7	7.6	192.0	0.12	0.01*
00:12	45	73	28	54.3	8.4	192.0	0.10	0.01*
00:14	40	62	22	47.3	9.0	192.0	0.08	0.00*
00:16	36	53	17	41.7	9.4	192.0	0.08	0.00*
00:18	34	50	16	39.3	9.1	184.6	0.08	0.00*
00:20	35	53	18	41.0	8.5	184.6	0.09	0.00*
00:22	36	58	22	43.3	7.7	184.6	0.10	0.00*
00:24	40	64	24	48.0	7.2	184.6	0.11	0.00*
00:26	42	69	27	51.0	7.2	184.6	0.12	0.00*
00:28	45	72	27	54.0	6.5	-	-	-
00:30	48	76	28	57.3	6.2	184.6	0.12	0.00*
00:32	50	80	30	60.0	6.0	184.6	0.12	0.00*
00:34	54	84	30	64.0	5.7	184.6	0.13	0.00*
00:36	56	87	31	66.3	5.6	184.6	0.13	0.00*
00:38	58	90	32	68.7	5.5	184.6	0.14	0.00*
00:40	60	91	31	70.3	5.5	177.8	0.14	0.00*
00:42	61	94	33	72.0	5.5	177.8	0.15	0.00*
00:44	61	94	33	72.0	5.5	177.8	0.17	0.00*
00:46	61	94	33	72.0	5.5	177.8	0.18	0.00*
00:48	61	95	34	72.3	6.0	177.8	0.16	0.00*
00:50	62	95	33	73.0	5.7	177.8	0.16	0.00*
00:52	62	95	33	73.0	5.7	177.8	0.16	0.00*
00:54	61	94	33	72.0	6.0	177.8	0.16	0.00*
00:56	60	94	34	71.3	6.0	177.8	0.17	-0.01*
00:58	60	93	33	71.0	5.8	177.8	-	-
01:00	60	92	32	70.7	6.0	177.8	0.17	0.00*
01:10	59	91	32	69.7	5.9	177.8	0.13	-0.02*
01:20	60	94	34	71.3	6.3	177.8	0.13	-0.02*
01:30	60	93	33	71.0	6.5	177.8	0.13	-0.03*
01:40	60	91	31	70.3	6.9	171.4	0.13	-0.03*
01:50	59	90	31	69.3	6.9	171.4	0.13	-0.03*
02:00	60	90	30	70.0	7.0	171.4	0.15	-0.03*
02:30	61	91	30	71.0	7.0	171.4	0.15	-0.05*
03:00	69	97	28	78.3	7.2	171.4	0.13	-0.02*
03:30	74	100	26	82.7	7.0	171.4	0.14	-0.02*
04:00	74	101	27	83.0	6.8	171.4	0.13	-0.01*
04:30	75	102	27	84.0	6.9	171.4	0.13	-0.01*

"Depressed S-T segment

APPENDIX (Continued.)

	TIME	DP	SP	PP	MAP	CVP	HR	R	T
29.	05:00	79	105	26	87.7	7.0	177.8	0.14	0.00*
	05:30	78	106	28	87.3	6.8	177.8	0.14	0.00*
	06:00	79	106	27	88.0	6.4	171.4	0.15	0.00
	06:30	80	110	30	90.0	6.3	171.4	0.16	0.00
	07:00	81	110	29	90.7	6.5	171.4	0.15	0.00
	07:30	81	110	29	90.7	6.2	171.4	0.15	0.00
	08:00	82	111	29	91.7	6.0	171.4	0.17	0.00
	08:30	82	111	29	91.7	6.1	171.4	0.15	0.00
	09:00	85	115	30	95.0	6.4	171.4	0.16	0.00
	09:30	84	114	30	94.0	6.0	171.4	0.17	0.00
	10:00	85	115	30	95.0	6.0	171.4	0.18	0.00
	10:30	85	118	33	96.0	6.0	171.4	0.17	0.00
	11:00	84	117	33	95.0	5.9	171.4	0.17	-0.01
	11:30	82	116	34	93.3	5.5	171.4	0.17	-0.01
	12:00	81	116	35	92.7	5.7	171.4	0.18	-0.01
	12:30	84	119	35	95.7	5.6	171.4	0.17	-0.01
	13:00	81	116	35	92.7	5.5	171.4	0.18	-0.02
	13:30	81	117	36	93.0	5.5	171.4	0.17	-0.01
	14:00	81	117	36	93.0	5.5	171.4	0.18	-0.02
	14:30	81	116	35	92.7	5.5	171.4	0.18	-0.02
	15:00	80	115	35	91.7	5.2	171.4	0.19	-0.02

30. Male (Neutered) Weight=5.29 kg
Injection Time=21.0 secs Amount Injected=5.3 ml

00:00	100	142	42	114.0	-1.9	160.0	0.06	0.14
00:02	101	144	43	115.3	-1.7	160.0	0.07	0.15
00:04	103	145	42	117.0	-1.7	160.0	0.06	0.14
00:06	105	147	42	119.0	-1.7	160.0	0.06	0.15
00:08	100	144	44	114.7	-0.7	160.0	0.06	0.16
00:10	83	126	43	97.3	-0.5	141.2	0.06	0.02d
00:12	67	109	42	81.0	0.7	129.7	0.11	-0.07d
00:14	50	95	45	65.0	1.0	114.3	0.11	-0.14d
00:16	44	85	41	57.7	1.5	114.3	0.09	-0.20d
00:18	40	80	40	53.3	2.0	104.3	0.04	-0.22d
00:20	37	84	47	52.7	2.5	96.0	0.09	-0.29d
00:22	29	73	44	43.7	2.7	66.7	0.09	-0.31d
00:24	25	68	43	39.3	3.2	58.5	0.05	-0.37d
00:26	24	60	36	36.0	3.5	55.8	0.06	-0.40d
00:28	23	58	35	34.7	3.5	55.8	0.06	-0.42d
00:30	21	55	34	32.3	3.5	53.3	0.07	-0.35d
00:32	20	52	32	30.7	3.5	53.3	0.07	-0.45d
00:34	20	52	32	30.7	3.5	51.1	0.07	-0.46d
00:36	20	50	30	30.0	3.5	52.2	0.09	-0.45d
00:38	20	49	29	29.7	3.5	53.3	0.09	-0.44d

"Depressed.S-T segment
d=Diphasic T value

APPENDIX (Continued.)

30.

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:40	20	48	28	29.3	3.5	53.3	0.09	-0.42 d
00:42	20	47	27	29.0	3.5	55.2	0.09	-0.42 d
00:44	20	47	27	29.0	3.5	55.2	0.09	-0.42 d
00:46	20	48	28	29.3	3.5	55.8	0.07	-0.42 d
00:48	20	46	26	28.7	3.5	59.2	0.09	-0.41 d
00:50	20	45	25	28.3	3.5	65.7	0.07	-0.39 d
00:52	20	46	26	28.7	3.2	68.6	0.06	-0.39 d
00:54	20	46	26	28.7	3.5	70.6	0.06	-0.35 d
00:56	21	46	25	29.3	3.5	73.8	0.06	-0.32 d
00:58	21	47	26	29.7	3.5	80.0	0.05	-0.30 d
01:00	22	47	25	30.3	3.2	80.0	0.06	-0.26 d
01:10	25	50	25	33.3	3.2	80.0	0.04	-0.21 d
01:20	26	54	28	35.3	3.5	80.0	0.02	-0.17 d
01:30	27	62	35	38.7	3.7	82.8	0.01	-0.15 d
01:40	32	67	35	43.7	3.8	85.7	0.01	-0.13 d
01:50	36	75	39	49.0	3.8	85.7	0.01	-0.15 d
02:00	40	79	39	53.0	3.8	92.3	0.01	-0.15 d
02:30	55	96	41	68.7	4.0	104.3	0.01	-0.13 d
03:00	75	113	38	87.7	3.7	104.3	0.01	-0.12 d
03:30	88	125	37	100.3	3.5	114.3	0.02	-0.06 d
04:00	99	135	36	135.0	3.5	114.3	0.02	-0.09 d
04:30	107	142	35	118.7	2.6	120.0	0.05	-0.06 d
05:00	116	151	35	127.7	3.5	120.0	0.02	-0.06 d
05:30	120	153	33	131.0	3.0	114.3	0.05	±0.06 d
06:00	125	159	34	136.3	3.2	114.3	0.06	±0.04 d
06:30	135	169	34	146.3	3.5	104.3	0.04	±0.04 d
07:00	138	174	36	150.0	2.5	114.3	0.09	0.04
07:30	144	180	36	156.0	3.2	114.3	0.07	0.06
08:00	152	190	38	164.7	2.2	120.0	0.06	0.04
08:30	150	185	35	161.7	3.0	120.0	0.06	0.06
09:00	157	194	37	169.3	2.5	114.3	0.10	0.06
09:30	145	177	32	155.7	3.0	133.3	0.10	0.04
10:00	152	186	34	163.3	-	-	-	-
10:30	140	168	28	149.3	2.0	-	-	-
11:00	120	147	27	129.0	3.7	-	-	-
11:30	100	128	28	109.3	4.0	-	-	-
12:00	87	115	28	96.3	4.5	133.3	0.02	±0.04 d
12:30	85	115	30	115.0	5.0	133.3	0.02	±0.04 d
13:00	82	113	31	92.3	5.0	133.3	0.02	0.04 d
13:30	80	113	33	91.0	5.0	133.3	0.02	0.04 d
14:00	78	110	32	88.7	5.0	133.3	0.02	-0.06 d
14:30	74	113	39	87.0	5.2	126.3	0.05	-0.10 d
15:00	-	-	-	-	5.0	126.3	0.05	-0.09 d

d=Diphasic T value

31. Male (Neutered.) Weight=5.17 kg
Injection Time=15.0 secs Amount Injected=5.2 ml

TIME	DP	SP	PP	MAP	CVP	HR	R	T
00:00	61	93	32	71.7	2.0	133.3	1.05	-0.03
00:02	61	94	33	72.0	2.0	133.3	1.05	-0.03
00:04	60	93	33	71.0	2.1	133.3	0.99	-0.03
00:06	60	92	32	70.7	2.2	133.3	1.02	-0.03
00:08	60	93	33	71.0	2.5	129.7	0.96	-0.04
00:10	59	90	31	69.3	3.0	129.7	0.88	-0.04
00:12	55	87	32	65.7	3.5	126.3	0.88	-0.06
00:14	50	79	29	59.7	4.0	123.1	0.84	-0.05
00:16	43	70	27	52.0	4.5	126.3	0.82	-0.06
00:18	40	63	23	47.7	4.4	120.0	0.84	-0.06
00:20	36	58	22	43.3	5.0	120.0	0.86	-0.06
00:22	35	54	19	41.3	5.0	120.0	0.83	-0.05
00:24	34	52	18	40.0	5.3	114.3	0.84	-0.06
00:26	32	50	18	38.0	5.3	114.3	0.84	-0.06
00:28	30	49	19	36.3	5.5	117.1	0.84	-0.06
00:30	30	49	19	36.3	5.5	114.3	0.81	-0.03d
00:32	30	49	19	36.3	5.5	114.3	0.84	±0.03d
00:34	30	49	19	36.3	5.5	114.3	0.82	±0.03d
00:36	31	50	19	37.3	5.5	114.3	0.81	±0.03d
00:38	33	50	17	38.7	5.3	114.3	0.82	±0.03d
00:40	35	52	17	40.7	5.0	114.3	0.81	±0.03d
00:42	36	54	18	42.0	5.0	117.1	0.81	±0.03d
00:44	39	57	18	45.0	5.2	114.3	0.81	±0.03d
00:46	40	57	17	45.7	5.2	114.3	0.82	±0.03d
00:48	40	57	17	45.7	5.1	114.3	0.81	-0.03d
00:50	39	56	17	44.7	5.2	114.3	0.87	0.03d
00:52	39	55	16	44.3	5.2	111.6	0.89	0.03d
00:54	36	55	19	42.3	6.0	111.6	0.90	±0.03d
00:56	37	55	18	43.0	6.0	111.6	0.81	-
00:58	37	55	18	43.0	6.0	109.1	0.87	±0.03d
01:00	38	56	18	44.0	6.0	104.3	0.94	0.03
01:10	39	59	20	45.7	5.7	109.1	0.91	0.06
01:20	42	65	23	49.7	6.0	111.6	0.90	-
01:30	43	68	25	51.3	6.2	109.1	0.90	0.03d
01:40	44	68	24	52.0	6.9	104.3	0.88	0.04d
01:50	45	70	25	53.3	6.8	106.7	0.87	±0.03d
02:00	44	69	25	52.3	6.5	111.6	0.87	±0.03d
02:30	47	75	28	56.3	6.5	109.1	0.84	-0.04d
03:00	50	76	26	58.7	6.7	114.3	1.05	-0.06d
03:30	50	81	31	60.3	6.5	111.6	-	-
04:00	52	84	32	62.7	5.7	109.1	0.84	-0.06d
04:30	55	87	32	65.7	5.7	111.6	0.83	-0.06

d=Diphasic T value

	TIME	DP	SP	PP	MAP	CVP	HR	R	T
31.	05:00	59	92	33	70.0	6.0	109.1	0.84	-0.06
	05:30	59	93	34	70.3	5.2	109.1	0.83	-0.06
	06:00	60	94	34	71.3	5.2	109.1	0.83	-0.04
	06:30	64	97	33	75.0	5.5	109.1	0.84	-0.06
	07:00	64	97	33	75.0	5.0	106.7	0.91	-0.07
	07:30	64	98	34	75.3	5.0	109.1	0.90	-0.07
	08:00	65	101	36	77.0	5.0	106.7	0.87	-0.06
	08:30	65	101	36	77.0	5.0	106.7	0.90	-0.05
	09:00	66	102	36	78.0	5.0	109.1	0.90	-0.05
	09:30	66	102	36	78.0	4.7	109.1	0.91	-0.06
	10:00	68	103	35	79.7	4.7	109.1	0.90	-0.05
	10:30	69	105	36	81.0	4.5	106.7	0.93	-0.05
	11:00	-	-	-	-	4.5	106.7	0.93	-0.05
	11:30	69	105	36	81.0	4.5	106.7	0.91	-0.04
	12:00	70	106	36	82.0	4.7	109.1	0.96	-0.06
	12:30	70	107	37	82.3	4.5	106.7	0.97	-0.03
	13:00	70	108	38	82.7	4.2	109.1	0.96	-0.05
	13:30	70	107	37	82.3	4.0	109.1	0.99	-0.04
	14:00	70	106	36	82.0	4.0	109.1	1.06	-0.03
	14:30	70	107	37	82.3	4.2	109.1	0.99	-0.06
	15:00	69	105	36	81.0	4.2	109.1	0.98	-0.07

32. Male (Neutered) Weight=4.38 kg
Injection Time=7 secs Amount Injected=4.4 ml

00:00	55	79	24	63.0	-0.9	133.3	0.25	-0.14
00:02	55	78	23	62.7	-0.5	133.3	0.25	-0.14
00:04	58	82	24	66.0	-0.5	137.1	0.27	-0.12
00:06	60	86	26	68.7	1.0	141.2	0.27	-0.12
00:08	52	76	24	60.0	1.0	120.0	0.21	-0.13
00:10	38	60	22	45.3	1.0	109.1	0.18	-0.18
00:12	31	50	19	37.3	1.0	100.0	0.17	-0.20
00:14	26	43	17	31.7	1.0	85.7	0.17	-0.24
00:16	25	39	14	29.7	1.1	77.4	0.16	-0.26
00:18	24	35	11	27.7	1.5	75.0	0.16	-0.28
00:20	24	35	11	27.7	1.6	72.7	0.16	-0.59
00:22	24	34	10	27.3	1.7	73.8	0.16	-0.62
00:24	22	32	10	25.3	1.7	79.3	-	-0.63
00:26	23	33	10	26.3	1.8	80.0	0.14	-0.64
00:28	22	32	10	25.3	1.7	82.8	0.14	-0.63
00:30	21	31	10	24.3	1.6	85.7	0.13	-0.66
00:32	20	30	10	23.3	1.6	85.7	0.14	-0.35d
00:34	20	28	8	22.7	1.5	98.0	0.13	-0.62
00:36	19	26	7	21.3	1.6	94.1	0.13	-0.58
00:38	17	24	7	19.3	1.7	92.3	0.14	-0.34d

d=Diphasic T value

APPENDIX (Continued.)

	TIME	DP	SP	PP	MAP	CVP	HR	R	T
32.	00:40	16	24	8	18.7	5.0	92.3	0.12	-0.74
	00:42	16	24	8	18.7	5.0	96.0	0.15	-0.66
	00:44	16	23	7	18.3	5.0	100.0	0.17	-0.60
	00:46	16	23	7	18.3	4.8	98.0	0.14	-0.60
	00:48	15	22	7	17.3	4.7	100.0	0.14	-0.64
	00:50	16	22	6	18.0	5.0	104.3	0.14	-0.37d
	00:52	16	23	7	18.3	5.0	104.3	0.14	-0.36d
	00:54	16	23	7	18.3	5.0	106.7	0.13	-0.35d
	00:56	16	24	8	18.7	5.0	106.7	0.15	-0.34d
	00:58	17	24	7	19.3	5.0	109.1	0.14	-0.34d
	01:00	18	24	6	20.0	5.0	109.1	0.14	-0.33d
	01:10	19	25	6	21.0	5.1	109.1	0.14	-0.30d
	01:20	20	26	6	22.0	5.4	109.1	0.14	-0.27d
	01:30	21	27	6	23.0	5.5	114.3	0.13	-0.25d
	01:40	24	29	5	25.7	6.0	120.0	0.11	-0.23d
	01:50	25	30	5	26.7	6.2	126.3	0.10	-0.15*
	02:00	28	35	7	30.0	5.7	133.3	0.12	-0.15d
	02:30	36	50	14	40.7	6.5	141.2	0.18	-0.12d
	03:00	40	56	16	45.3	6.7	145.4	0.17	-0.13d
	03:30	50	70	20	56.7	4.2	141.2	0.20	-0.10
	04:00	66	88	22	73.3	3.7	145.4	0.31	-0.08
	04:30	75	95	20	81.7	3.7	141.2	0.24	-0.09
	05:00	85	105	20	91.7	3.2	150.0	0.22	-0.08
	05:30	89	110	21	96.0	3.0	150.0	0.24	-0.08
	06:00	95	117	22	102.3	2.8	150.0	0.22	-0.06
	06:30	103	126	23	110.7	2.5	154.8	0.23	-0.06
	07:00	101	130	29	110.7	2.5	160.0	0.22	-0.05
	07:30	106	136	30	116.0	2.7	177.8	0.22	-0.04
	08:00	114	140	26	122.7	1.2	177.8	0.18	-0.05
	08:30	97	128	31	107.3	1.7	192.0	0.20	-0.04
	09:00	112	141	29	121.7	1.7	177.8	0.19	-0.04
	09:30	107	139	32	117.7	1.5	171.4	0.23	-0.03
	10:00	103	129	26	111.7	1.7	154.8	0.20	-0.01
	10:30	100	125	25	108.3	2.0	150.0	0.19	-0.03
	11:00	90	114	24	98.0	1.7	141.2	0.19	-0.02
	11:30	92	114	22	99.3	1.7	145.4	0.18	-0.02
	12:00	94	115	21	101.0	1.7	150.0	0.20	-0.02
	12:30	99	121	22	106.3	1.1	150.0	0.23	-0.03
	13:00	96	119	23	103.7	1.0	150.0	0.21	-0.03
	13:30	98	120	22	105.3	1.1	150.0	0.21	-0.02
	14:00	94	113	29	100.3	1.1	150.0	0.21	-0.03
	14:30	94	113	19	100.3	1.1	150.0	0.24	-0.04
	15:00	92	111	19	98.3	1.0	145.4	0.22	-0.02

d=Diphasic T value
*Depressed S-T segment

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