

IX. Physiological Examinations

1) Cardiovascular system

- 1. Blood pressure and pulse rate
- 2. Digital plethysmogram
- 3. Electrocardiography
- 4. Ultrasonic cardiography
- 5. Intima-madia thickness of carotid artery

2) Respiratory system

- 1. Pulmonary functions
- 2. Blood oxygen saturation

1) Cardiovascular system

1. Blood pressure and pulse rate

(Automatic blood pressure analyzer, BP-204RV, Colin, Inc.,)

Systolic Blood Pressure (mmHg)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	118.9	15.2	273	121.3	16.2	295	125.4	19.8	290	127.1	19.4	273	125.0	14.0	17	123.2	18.0	1148
Female	111.4	16.1	258	117.7	18.2	283	123.5	20.2	271	130.1	19.3	266	131.3	22.7	22	120.9	19.8	1100
Total	115.2	16.1	531	119.6	17.3	578	124.5	20.0	561	128.6	19.4	539	128.6	19.4	39	122.1	18.9	2248

Diastolic Blood Pressure (mmHg)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	75.3	10.3	273	77.0	10.3	295	77.2	11.5	290	75.8	11.1	273	72.2	7.8	17	76.3	10.8	1148
Female	69.1	10.0	258	72.7	11.0	283	74.6	11.7	271	75.5	11.4	266	73.7	12.2	22	73.0	11.3	1100
Total	72.3	10.6	531	74.9	10.8	578	75.9	11.7	561	75.6	11.3	539	73.1	10.4	39	74.7	11.2	2248

Pulse Rate (/min)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	66.3	8.9	273	67.0	9.4	295	68.0	10.3	289	69.9	11.0	273	68.2	11.8	17	67.8	10.1	1147
Female	70.0	9.9	258	70.3	9.6	283	71.1	10.4	271	74.1	10.3	265	74.7	9.1	22	71.4	10.2	1099
Total	68.1	9.6	531	68.6	9.7	578	69.5	10.5	560	72.0	10.9	538	71.8	10.8	39	69.6	10.3	2246

2. Digital plethysmogram

(Digital plethysmography, Omniace RT3300, NEC Corp.,)

SX (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	6.3	0.9	256	6.5	0.8	268	6.6	0.9	275	6.5	1.0	266	6.6	0.8	17	6.5	0.9	1082
Female	6.4	0.8	252	6.5	0.8	267	6.5	0.8	262	6.6	0.9	258	6.4	0.8	22	6.5	0.8	1061
Total	6.4	0.9	508	6.5	0.8	535	6.6	0.9	537	6.6	0.9	524	6.5	0.8	39	6.5	0.9	2143

SS (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	24.1	3.6	256	24.1	3.6	268	23.8	3.9	275	23.2	4.1	266	23.2	4.6	17	23.8	3.8	1082
Female	23.4	3.3	252	23.5	3.4	267	23.2	3.5	262	22.3	3.5	258	21.2	3.2	22	23.1	3.4	1061
Total	23.8	3.5	508	23.8	3.5	535	23.5	3.7	537	22.8	3.8	524	22.1	3.9	39	23.4	3.7	2143

Corrected Up-stroke Time(sec)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.258	0.029	256	0.266	0.025	268	0.270	0.027	275	0.272	0.029	266	0.277	0.023	17	0.267	0.028	1082
Female	0.266	0.023	252	0.270	0.022	267	0.272	0.024	262	0.279	0.024	258	0.276	0.023	22	0.272	0.024	1061
Total	0.262	0.027	508	0.268	0.024	535	0.271	0.026	537	0.275	0.027	524	0.277	0.023	39	0.269	0.026	2143

3. Electrocardiography

(Automatic EKG analyzer, Kartizer5500, NEC Corp.,)

Heart Rate(/min)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	62.5	8.8	273	63.0	9.2	295	64.3	11.6	291	66.2	12.5	275	66.3	13.4	17	64.0	10.8	1151
Female	64.7	9.6	261	64.7	9.7	283	66.0	10.7	269	68.9	10.9	268	71.0	11.1	21	66.2	10.4	1102
Total	63.6	9.3	534	63.8	9.5	578	65.1	11.2	560	67.6	11.8	543	68.9	12.2	38	65.1	10.6	2253

PR-interval (msec)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	155.6	21.4	273	162.6	25.6	294	161.3	21.7	286	167.5	24.0	264	167.8	24.4	16	161.8	23.6	1133
Female	149.6	20.4	260	155.0	20.3	282	156.3	20.5	266	158.1	24.8	265	157.7	21.3	21	154.8	21.7	1094
Total	152.7	21.1	533	158.9	23.4	576	158.9	21.2	552	162.7	24.9	529	162.1	22.9	37	158.4	23.0	2227

QRS-width (msec)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	90.7	9.8	273	91.2	12.1	295	91.3	13.4	291	93.7	16.3	275	88.5	11.6	17	91.7	13.1	1151
Female	81.4	9.1	261	83.3	10.1	283	85.4	12.1	269	84.4	12.1	268	85.5	14.7	21	83.7	11.1	1102
Total	86.2	10.5	534	87.4	11.8	578	88.5	13.1	560	89.1	15.1	543	86.8	13.3	38	87.8	12.8	2253

QT–interval (msec)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	393.0	26.9	273	395.2	27.6	295	397.5	30.6	291	398.0	31.5	275	403.5	33.5	17	396.1	29.3	1151
Female	399.2	27.7	261	402.4	29.9	283	405.2	31.6	268	397.4	31.2	268	396.8	31.7	21	401.0	30.3	1101
Total	396.0	27.5	534	398.7	28.9	578	401.2	31.3	559	397.7	31.3	543	399.8	32.3	38	398.5	29.9	2252

QTc–interval (msec)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	398.2	19.5	273	401.9	20.4	295	407.5	20.9	291	413.7	23.7	275	419.4	26.9	17	405.5	22.0	1151
Female	411.3	20.5	261	414.6	20.4	283	421.0	22.9	268	422.3	22.5	268	427.7	19.1	21	417.5	22.0	1101
Total	404.7	21.0	534	408.1	21.4	578	414.0	22.8	559	417.9	23.5	543	424.0	23.0	38	411.4	22.8	2252

S(V1)–height (mV)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	–0.876	0.396	273	–0.853	0.421	292	–0.852	0.498	285	–0.805	0.432	258	–0.768	0.334	17	–0.846	0.438	1125
Female	–0.841	0.356	261	–0.790	0.339	281	–0.739	0.423	261	–0.721	0.465	260	–0.799	0.391	20	–0.774	0.400	1083
Total	–0.859	0.377	534	–0.822	0.384	573	–0.798	0.467	546	–0.762	0.451	518	–0.784	0.361	37	–0.810	0.421	2208

R(V5)–height (mV)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	1.628	0.502	273	1.703	0.600	295	1.744	0.607	291	1.687	0.653	275	1.762	0.722	17	1.693	0.596	1151
Female	1.287	0.430	261	1.427	0.466	283	1.565	0.521	269	1.605	0.584	268	1.761	0.626	21	1.477	0.521	1102
Total	1.461	0.498	534	1.568	0.556	578	1.658	0.574	560	1.646	0.621	543	1.762	0.661	38	1.587	0.571	2253

QRS–axis (degree)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	51.3	27.8	272	41.1	29.9	295	39.4	34.4	289	36.6	37.1	274	25.4	38.7	17	41.8	33.0	1147
Female	54.4	28.0	259	49.0	27.6	282	34.7	29.1	268	29.0	31.1	268	31.3	36.8	21	41.6	30.9	1098
Total	52.8	27.9	531	44.9	29.0	577	37.1	32.0	557	32.9	34.4	542	28.7	37.3	38	41.7	32.0	2245

P–axis (degree)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	48.5	28.3	267	48.0	27.4	292	53.8	26.3	284	56.0	27.5	257	53.8	27.1	16	51.5	27.5	1116
Female	50.0	27.3	257	49.7	28.1	279	50.5	24.7	264	48.7	28.5	263	34.3	50.2	21	49.4	27.8	1084
Total	49.3	27.8	524	48.8	27.7	571	52.2	25.5	548	52.3	28.3	520	42.7	42.4	37	50.5	27.7	2200

T-axis (degree)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	39.8	25.3	272	39.9	26.4	292	43.2	31.4	288	47.9	32.5	270	54.1	29.3	17	42.8	29.2	1139
Female	38.5	22.1	259	34.8	30.4	280	36.2	30.3	266	40.2	32.8	263	35.3	29.8	19	37.3	29.2	1087
Total	39.2	23.8	531	37.4	28.5	572	39.8	31.0	554	44.1	32.8	533	44.2	30.7	36	40.1	29.3	2226

CV of R-R

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	3.4	1.3	234	2.9	1.0	242	2.6	1.1	220	2.5	1.1	182	2.7	1.1	11	2.9	1.2	889
Female	3.3	1.2	229	2.8	1.0	249	2.7	1.2	231	2.4	1.0	204	2.4	1.2	17	2.8	1.1	930
Total	3.4	1.2	463	2.9	1.0	491	2.6	1.1	451	2.4	1.1	386	2.5	1.2	28	2.9	1.2	1819

Minnesota Code

		40 – 49yr		50 – 59yr		60 – 69yr		70 – 79yr		80yr –		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
Minnesota Code 1-0-0	Male	59	21.6	52	17.6	38	13.1	29	10.5	2	11.8	180	15.6
	Female	61	23.4	46	16.2	23	8.5	28	10.4	2	9.1	160	14.5
	Total	120	22.5	98	16.9	61	10.9	57	10.5	4	10.3	340	15.1
Minnesota Code 1-1-1	Male	0	0	0	0	0	0	7	2.5	0	0	7	0.6
	Female	0	0	3	1.1	1	0.4	0	0	0	0	4	0.4
	Total	0	0	3	0.5	1	0.2	7	1.3	0	0	11	0.5
Minnesota Code 1-1-2	Male	1	0.4	0	0	0	0	0	0	0	0	1	0.1
	Female	0	0	1	0.4	0	0	1	0.4	0	0	2	0.2
	Total	1	0.2	1	0.2	0	0	1	0.2	0	0	3	0.1
Minnesota Code 1-1-3	Male	1	0.4	2	0.7	1	0.3	2	0.7	0	0	6	0.5
	Female	0	0	1	0.4	2	0.7	0	0	1	4.5	4	0.4
	Total	1	0.2	3	0.5	3	0.5	2	0.4	1	2.6	10	0.4
Minnesota Code 1-1-4	Male	3	1.1	0	0	2	0.7	2	0.7	0	0	7	0.6
	Female	0	0	0	0	1	0.4	3	1.1	0	0	4	0.4
	Total	3	0.6	0	0	3	0.5	5	0.9	0	0	11	0.5
Minnesota Code 1-1-5	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota Code 1-1-6	Male	0	0	1	0.3	1	0.3	0	0	0	0	2	0.2
	Female	0	0	0	0	1	0.4	0	0	0	0	1	0.1
	Total	0	0	1	0.2	2	0.4	0	0	0	0	3	0.1

Minnesota Code 1-1-7	Male	0	0	0	0	0	0	1	0.4	0	0	1	0.1
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	1	0.2	0	0	1	0.0
Minnesota Code 1-2-1	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	1	0.4	0	0	1	0.1
	Total	0	0	0	0	0	0	1	0.2	0	0	1	0.0
Minnesota Code 1-2-2	Male	0	0	0	0	0	0	1	0.4	0	0	1	0.1
	Female	0	0	0	0	1	0.4	0	0	0	0	1	0.1
	Total	0	0	0	0	1	0.2	1	0.2	0	0	2	0.1
Minnesota Code 1-2-3	Male	0	0	0	0	0	0	2	0.7	0	0	2	0.2
	Female	0	0	1	0.4	0	0	1	0.4	0	0	2	0.2
	Total	0	0	1	0.2	0	0	3	0.6	0	0	4	0.2
Minnesota Code 1-2-4	Male	2	0.7	1	0.3	1	0.3	2	0.7	0	0	6	0.5
	Female	1	0.4	1	0.4	1	0.4	5	1.9	0	0	8	0.7
	Total	3	0.6	2	0.3	2	0.4	7	1.3	0	0	14	0.6
Minnesota Code 1-2-5	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	1	0.4	0	0	0	0	0	0	1	0.1
	Total	0	0	1	0.2	0	0	0	0	0	0	1	0.0
Minnesota Code 1-2-6	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota Code 1-2-7	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota Code 1-2-8	Male	0	0	0	0	1	0.3	0	0	0	0	1	0.1
	Female	1	0.4	2	0.7	0	0	0	0	0	0	3	0.3
	Total	1	0.2	2	0.3	1	0.2	0	0	0	0	4	0.2
Minnesota Code 1-3-1	Male	0	0	0	0	1	0.3	0	0	0	0	1	0.1
	Female	0	0	1	0.4	0	0	0	0	0	0	1	0.1
	Total	0	0	1	0.2	1	0.2	0	0	0	0	2	0.1
Minnesota Code 1-3-2	Male	0	0	0	0	2	0.7	8	2.9	0	0	10	0.9
	Female	2	0.8	1	0.4	2	0.7	2	0.7	0	0	7	0.6
	Total	2	0.4	1	0.2	4	0.7	10	1.8	0	0	17	0.8
Minnesota Code 1-3-3	Male	3	1.1	1	0.3	3	1.0	2	0.7	1	5.9	10	0.9
	Female	0	0	0	0	1	0.4	5	1.9	0	0	6	0.5
	Total	3	0.6	1	0.2	4	0.7	7	1.3	1	2.6	16	0.7
Minnesota Code 1-3-4	Male	0	0	3	1.0	3	1.0	2	0.7	0	0	8	0.7
	Female	2	0.8	5	1.8	3	1.1	0	0	0	0	10	0.9
	Total	2	0.4	8	1.4	6	1.1	2	0.4	0	0	18	0.8
Minnesota Code 1-3-5	Male	0	0	0	0	1	0.3	0	0	0	0	1	0.1
	Female	1	0.4	0	0	1	0.4	0	0	0	0	2	0.2
	Total	1	0.2	0	0	2	0.4	0	0	0	0	3	0.1
Minnesota Code 1-3-6	Male	1	0.4	5	1.7	8	2.7	9	3.3	1	5.9	24	2.1
	Female	6	2.3	4	1.4	7	2.6	10	3.7	1	4.5	28	2.5
	Total	7	1.3	9	1.6	15	2.7	19	3.5	2	5.1	52	2.3
Minnesota Code 2-1	Male	2	0.7	1	0.3	6	2.1	7	2.5	1	5.9	17	1.5
	Female	2	0.8	2	0.7	5	1.8	9	3.3	0	0	18	1.6

	Total	4	0.7	3	0.5	11	2.0	16	2.9	1	2.6	35	1.5
Minnesota Code 2-2	Male	0	0	0	0	1	0.3	0	0	0	0	1	0.1
	Female	1	0.4	1	0.4	0	0	0	0	0	0	2	0.2
	Total	1	0.2	1	0.2	1	0.2	0	0	0	0	3	0.1
Minnesota Code 2-3	Male	8	2.9	4	1.4	4	1.4	3	1.1	1	5.9	20	1.7
	Female	8	3.1	10	3.5	1	0.4	2	0.7	0	0	21	1.9
	Total	16	3.0	14	2.4	5	0.9	5	0.9	1	2.6	41	1.8
Minnesota Code 2-4	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota Code 2-5	Male	0	0	0	0	0	0	1	0.4	0	0	1	0.1
	Female	1	0.4	0	0	1	0.4	0	0	0	0	2	0.2
	Total	1	0.2	0	0	1	0.2	1	0.2	0	0	3	0.1
Minnesota Code 3-1	Male	18	6.6	22	7.4	26	8.9	27	9.8	2	11.8	95	8.2
	Female	1	0.4	8	2.8	13	4.8	12	4.5	2	9.1	36	3.3
	Total	19	3.6	30	5.2	39	6.9	39	7.2	4	10.3	131	5.8
Minnesota Code 3-2	Male	1	0.4	1	0.3	0	0	2	0.7	0	0	4	0.3
	Female	0	0	2	0.7	2	0.7	2	0.7	0	0	6	0.5
	Total	1	0.2	3	0.5	2	0.4	4	0.7	0	0	10	0.4
Minnesota Code 3-3-1	Male	1	0.4	3	1.0	6	2.1	3	1.1	0	0	13	1.1
	Female	1	0.4	0	0	5	1.8	2	0.7	0	0	8	0.7
	Total	2	0.4	3	0.5	11	2.0	5	0.9	0	0	21	0.9
Minnesota Code 3-3-2	Male	11	4.0	14	4.7	22	7.6	7	2.5	0	0	54	4.7
	Female	6	2.3	4	1.4	10	3.7	8	3.0	0	0	28	2.5
	Total	17	3.2	18	3.1	32	5.7	15	2.8	0	0	82	3.6
Minnesota Code 3-4	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	1	4.5	1	0.1
	Total	0	0	0	0	0	0	0	0	1	2.6	1	0.0
Minnesota Code 4-1-1	Male	1	0.4	1	0.3	2	0.7	3	1.1	0	0	7	0.6
	Female	2	0.8	1	0.4	5	1.8	4	1.5	0	0	12	1.1
	Total	3	0.6	2	0.3	7	1.2	7	1.3	0	0	19	0.8
Minnesota Code 4-1-2	Male	4	1.5	4	1.4	7	2.4	14	5.1	2	11.8	31	2.7
	Female	3	1.1	3	1.1	6	2.2	14	5.2	1	4.5	27	2.4
	Total	7	1.3	7	1.2	13	2.3	28	5.1	3	7.7	58	2.6
Minnesota Code 4-2	Male	7	2.6	12	4.1	15	5.2	22	8.0	1	5.9	57	4.9
	Female	6	2.3	14	4.9	18	6.6	23	8.6	2	9.1	63	5.7
	Total	13	2.4	26	4.5	33	5.9	45	8.3	3	7.7	120	5.3
Minnesota Code 4-3	Male	17	6.2	23	7.8	33	11.3	47	17.1	4	23.5	124	10.8
	Female	29	11.1	25	8.8	50	18.5	64	23.8	4	18.2	172	15.5
	Total	46	8.6	48	8.3	83	14.8	111	20.4	8	20.5	296	13.1
Minnesota Code 4-4	Male	1	0.4	3	1.0	6	2.1	5	1.8	0	0	15	1.3
	Female	2	0.8	1	0.4	1	0.4	7	2.6	1	4.5	12	1.1
	Total	3	0.6	4	0.7	7	1.2	12	2.2	1	2.6	27	1.2
Minnesota Code 5-1	Male	0	0	3	1.0	4	1.4	4	1.5	0	0	11	1.0
	Female	1	0.4	1	0.4	2	0.7	0	0	0	0	4	0.4
	Total	1	0.2	4	0.7	6	1.1	4	0.7	0	0	15	0.7
Minnesota Code 5-2	Male	7	2.6	7	2.4	16	5.5	21	7.6	2	11.8	53	4.6
	Female	12	4.6	14	4.9	17	6.3	26	9.7	1	4.5	70	6.3

	Total	19	3.6	21	3.6	33	5.9	47	8.6	3	7.7	123	5.4
Minnesota Code 5-3	Male	7	2.6	9	3.0	16	5.5	22	8.0	0	0	54	4.7
	Female	7	2.7	13	4.6	17	6.3	21	7.8	2	9.1	60	5.4
	Total	14	2.6	22	3.8	33	5.9	43	7.9	2	5.1	114	5.0
Minnesota Code 5-4	Male	7	2.6	10	3.4	17	5.8	8	2.9	2	11.8	44	3.8
	Female	3	1.1	17	6.0	21	7.7	22	8.2	2	9.1	65	5.9
	Total	10	1.9	27	4.7	38	6.8	30	5.5	4	10.3	109	4.8
Minnesota Code 5-5	Male	13	4.8	22	7.4	27	9.3	27	9.8	2	11.8	91	7.9
	Female	13	5.0	39	13.7	43	15.9	48	17.8	6	27.3	149	13.5
	Total	26	4.9	61	10.5	70	12.5	75	13.8	8	20.5	240	10.6
Minnesota Code 6-1	Male	0	0	0	0	1	0.3	0	0	0	0	1	0.1
	Female	0	0	0	0	1	0.4	0	0	0	0	1	0.1
	Total	0	0	0	0	2	0.4	0	0	0	0	2	0.1
Minnesota Code 6-2-1	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota Code 6-2-3	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota Code 6-3	Male	0	0	6	2.0	3	1.0	9	3.3	0	0	18	1.6
	Female	1	0.4	0	0	0	0	7	2.6	0	0	8	0.7
	Total	1	0.2	6	1.0	3	0.5	16	2.9	0	0	26	1.2
Minnesota Code 6-4-1	Male	1	0.4	1	0.3	0	0	0	0	0	0	2	0.2
	Female	1	0.4	0	0	1	0.4	0	0	0	0	2	0.2
	Total	2	0.4	1	0.2	1	0.2	0	0	0	0	4	0.2
Minnesota Code 6-5	Male	8	2.9	1	0.3	3	1.0	3	1.1	1	5.9	16	1.4
	Female	11	4.2	9	3.2	8	3.0	9	3.3	0	0	37	3.3
	Total	19	3.6	10	1.7	11	2.0	12	2.2	1	2.6	53	2.3
Minnesota Code 6-8	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota Code 7-1-1	Male	1	0.4	2	0.7	1	0.3	2	0.7	0	0	6	0.5
	Female	0	0	1	0.4	0	0	1	0.4	0	0	2	0.2
	Total	1	0.2	3	0.5	1	0.2	3	0.6	0	0	8	0.4
Minnesota Code 7-2-1	Male	1	0.4	4	1.4	11	3.8	20	7.3	0	0	36	3.1
	Female	0	0	2	0.7	5	1.8	7	2.6	1	4.5	15	1.4
	Total	1	0.2	6	1.0	16	2.8	27	5.0	1	2.6	51	2.3
Minnesota Code 7-3	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota Code 7-4	Male	0	0	1	0.3	2	0.7	1	0.4	0	0	4	0.3
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	1	0.2	2	0.4	1	0.2	0	0	4	0.2
Minnesota Code 7-5	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota Code 7-6	Male	0	0	0	0	0	0	0	0	0	0	0	0

	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota Code 7-7	Male	1	0.4	0	0	0	0	1	0.4	0	0	2	0.2
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	1	0.2	0	0	0	0	1	0.2	0	0	2	0.1
Minnesota Code 7-8	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota Code 8-1-1	Male	0	0	0	0	0	0	1	0.4	0	0	1	0.1
	Female	0	0	0	0	1	0.4	1	0.4	0	0	2	0.2
	Total	0	0	0	0	1	0.2	2	0.4	0	0	3	0.1
Minnesota Code 8-1-2	Male	3	1.1	1	0.3	2	0.7	7	2.5	1	5.9	14	1.2
	Female	0	0	3	1.1	1	0.4	0	0	0	0	4	0.4
	Total	3	0.6	4	0.7	3	0.5	7	1.3	1	2.6	18	0.8
Minnesota Code 8-1-3	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota Code 8-2-2	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota Code 8-2-3	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota Code 8-3-1	Male	0	0	1	0.3	4	1.4	10	3.6	1	5.9	16	1.4
	Female	1	0.4	1	0.4	1	0.4	3	1.1	0	0	6	0.5
	Total	1	0.2	2	0.3	5	0.9	13	2.4	1	2.6	22	1.0
Minnesota Code 8-3-2	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota Code 8-4-1	Male	0	0	2	0.7	2	0.7	1	0.4	0	0	5	0.4
	Female	3	1.1	0	0	4	1.5	2	0.7	1	4.5	10	0.9
	Total	3	0.6	2	0.3	6	1.1	3	0.6	1	2.6	15	0.7
Minnesota Code 8-4-2	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota Code 8-5-2	Male	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota Code 8-7	Male	0	0	1	0.3	2	0.7	2	0.7	0	0	5	0.4
	Female	0	0	2	0.7	2	0.7	3	1.1	0	0	7	0.6
	Total	0	0	3	0.5	4	0.7	5	0.9	0	0	12	0.5
Minnesota Code 8-8	Male	17	6.2	17	5.7	19	6.5	14	5.1	1	5.9	68	5.9
	Female	9	3.4	10	3.5	9	3.3	5	1.9	1	4.5	34	3.1
	Total	26	4.9	27	4.7	28	5.0	19	3.5	2	5.1	102	4.5
Minnesota Code 8-9	Male	13	4.8	12	4.1	19	6.5	30	10.9	2	11.8	76	6.6
	Female	8	3.1	6	2.1	14	5.2	31	11.5	3	13.6	62	5.6
	Total	21	3.9	18	3.1	33	5.9	61	11.2	5	12.8	138	6.1
Minnesota Code 9-1	Male	3	1.1	4	1.4	16	5.5	15	5.5	0	0	38	3.3

	Female	10	3.8	5	1.8	7	2.6	10	3.7	0	0	32	2.9
	Total	13	2.4	9	1.6	23	4.1	25	4.6	0	0	70	3.1
Minnesota Code 9-2	Male	20	7.3	27	9.1	23	7.9	11	4.0	2	11.8	83	7.2
	Female	3	1.1	6	2.1	6	2.2	7	2.6	2	9.1	24	2.2
	Total	23	4.3	33	5.7	29	5.2	18	3.3	4	10.3	107	4.7
Minnesota Code 9-3-1	Male	0	0	1	0.3	2	0.7	3	1.1	0	0	6	0.5
	Female	0	0	1	0.4	2	0.7	1	0.4	0	0	4	0.4
	Total	0	0	2	0.3	4	0.7	4	0.7	0	0	10	0.4
Minnesota Code 9-3-2	Male	0	0	0	0	2	0.7	0	0	0	0	2	0.2
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	2	0.4	0	0	0	0	2	0.1
Minnesota Code 9-4-1	Male	136	49.8	167	56.4	149	51.2	136	49.5	10	58.8	598	51.9
	Female	150	57.5	169	59.5	174	64.2	160	59.5	12	54.5	665	60.1
	Total	286	53.6	336	57.9	323	57.5	296	54.4	22	56.4	1263	55.9
Minnesota Code 9-4-2	Male	12	4.4	13	4.4	19	6.5	21	7.6	2	11.8	67	5.8
	Female	6	2.3	10	3.5	12	4.4	12	4.5	2	9.1	42	3.8
	Total	18	3.4	23	4.0	31	5.5	33	6.1	4	10.3	109	4.8
Minnesota Code 9-5	Male	23	8.4	26	8.8	21	7.2	10	3.6	0	0	80	6.9
	Female	1	0.4	0	0	2	0.7	0	0	0	0	3	0.3
	Total	24	4.5	26	4.5	23	4.1	10	1.8	0	0	83	3.7
Minnesota Code 9-8-1	Male	0	0	0	0	0	0	1	0.4	0	0	1	0.1
	Female	0	0	1	0.4	3	1.1	1	0.4	1	4.5	6	0.5
	Total	0	0	1	0.2	3	0.5	2	0.4	1	2.6	7	0.3
Total	Male	273	100.0	296	100.0	291	100.0	275	100.0	17	100.0	1152	100.0
	Female	261	100.0	284	100.0	271	100.0	269	100.0	22	100.0	1107	100.0
	Total	534	100.0	580	100.0	562	100.0	544	100.0	39	100.0	2259	100.0

4. Ultrasonic cardiography

(Ultrasonic tomography, EUB-655, Hitachi Medical Corp.,)

Aortic Dimension (AOD) (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	27.64	3.27	269	28.45	3.42	295	28.78	3.62	289	29.20	3.88	264	27.09	3.68	17	28.50	3.60	1134
Female	24.49	3.03	255	25.57	3.19	276	26.03	3.91	264	26.38	3.54	265	26.75	4.11	22	25.65	3.52	1082
Total	26.11	3.52	524	27.06	3.61	571	27.47	4.00	553	27.79	3.97	529	26.90	3.88	39	27.11	3.83	2216

Left Atrium Dimension (LAD) (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	33.23	4.11	269	33.46	4.21	295	34.35	4.88	289	34.58	5.44	264	33.82	6.48	17	33.90	4.73	1134
Female	30.46	4.20	255	31.60	4.29	276	32.95	4.69	263	34.17	5.03	265	35.62	5.93	22	32.37	4.81	1081
Total	31.88	4.38	524	32.56	4.35	571	33.68	4.84	552	34.37	5.24	529	34.84	6.16	39	33.15	4.83	2215

LAD/AOD Ratio

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	1.21	0.15	269	1.18	0.16	295	1.20	0.19	289	1.19	0.20	264	1.25	0.19	17	1.20	0.18	1134
Female	1.25	0.18	255	1.24	0.16	276	1.28	0.20	263	1.31	0.22	265	1.37	0.37	22	1.27	0.20	1081
Total	1.23	0.17	524	1.21	0.16	571	1.24	0.20	552	1.25	0.22	529	1.31	0.31	39	1.23	0.19	2215

E-wave Amplitude (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	20.43	3.67	273	19.46	3.53	293	18.34	3.51	283	17.72	3.54	257	17.44	3.89	16	18.99	3.71	1122
Female	19.40	3.46	255	18.12	3.37	279	17.43	3.22	254	16.62	3.66	246	15.72	2.25	19	17.87	3.56	1053
Total	19.94	3.60	528	18.81	3.52	572	17.91	3.40	537	17.18	3.64	503	16.50	3.18	35	18.45	3.68	2175

A-wave Amplitude (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	16.15	3.56	273	16.17	3.55	293	15.76	3.41	283	15.66	3.28	257	15.47	3.09	16	15.93	3.45	1122
Female	14.83	3.42	255	14.56	3.35	279	14.68	3.11	254	14.27	3.32	246	14.39	2.98	19	14.59	3.30	1053
Total	15.51	3.55	528	15.38	3.54	572	15.25	3.31	537	14.98	3.36	503	14.89	3.03	35	15.28	3.44	2175

Diastolic Descent Rate (DDR) (mm/s)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	92.1	24.1	273	82.0	22.1	293	69.5	22.7	283	59.6	21.8	257	49.9	18.7	16	75.7	25.8	1122
Female	85.8	20.4	255	78.3	22.2	279	65.1	21.1	254	54.3	21.3	246	43.1	13.7	19	70.7	24.5	1053
Total	89.1	22.6	528	80.2	22.2	572	67.4	22.1	537	57.0	21.7	503	46.2	16.3	35	73.3	25.3	2175

A/E Ratio

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.786	0.109	273	0.826	0.115	293	0.862	0.139	283	0.890	0.166	257	0.895	0.099	16	0.841	0.138	1122
Female	0.759	0.113	255	0.801	0.130	279	0.839	0.108	254	0.863	0.142	246	0.912	0.138	19	0.816	0.131	1053
Total	0.773	0.112	528	0.814	0.123	572	0.851	0.126	537	0.877	0.155	503	0.904	0.120	35	0.829	0.135	2175

Left Ventricular End-diastolic Dimension (LVEdD) (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	48.31	4.42	269	47.93	4.41	276	47.64	4.60	260	46.52	4.84	198	47.00	4.58	10	47.67	4.58	1013
Female	44.47	3.79	252	44.75	4.18	267	44.89	4.40	229	44.63	4.80	198	44.39	3.93	12	44.68	4.27	958
Total	46.45	4.55	521	46.37	4.58	543	46.35	4.71	489	45.58	4.91	396	45.58	4.34	22	46.22	4.68	1971

Left Ventricular End-systolic Dimension (LVEsD) (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	31.14	4.37	269	30.47	4.40	276	30.29	4.75	260	28.92	5.17	198	31.31	4.25	10	30.31	4.69	1013
Female	27.79	3.65	252	27.50	4.34	267	27.09	4.60	229	28.06	5.43	198	27.20	6.86	12	27.59	4.53	958
Total	29.52	4.37	521	29.01	4.61	543	28.79	4.94	489	28.49	5.31	396	29.07	6.06	22	28.99	4.81	1971

Left Ventricular Posterior Wall Thickness at end-diastole (LVPWd) (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	10.25	2.19	269	10.54	2.17	276	10.65	2.27	260	10.76	2.25	198	11.02	2.15	10	10.54	2.22	1013
Female	8.97	1.86	252	9.30	1.90	267	9.98	2.14	229	9.66	2.21	198	9.73	1.95	12	9.46	2.05	958
Total	9.63	2.13	521	9.93	2.13	543	10.34	2.23	489	10.21	2.29	396	10.31	2.10	22	10.01	2.21	1971

Left Ventricular Posterior Wall Thickness at end-systole (LVPWs) (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	16.70	2.56	269	16.95	2.93	276	17.29	2.75	260	17.36	2.85	198	16.55	2.67	10	17.05	2.78	1013
Female	14.87	2.41	252	15.57	2.60	267	16.32	2.90	229	15.56	3.12	198	16.74	3.91	12	15.58	2.80	958
Total	15.82	2.65	521	16.27	2.86	543	16.84	2.86	489	16.46	3.12	396	16.65	3.33	22	16.33	2.89	1971

Interventricular Septum Diastolic Thickness (IVSd) (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	11.52	2.29	269	11.59	2.42	276	12.21	2.39	260	12.09	2.46	198	12.20	1.73	10	11.84	2.40	1013
Female	9.75	2.02	252	10.42	2.24	267	10.90	2.33	229	11.45	2.49	198	11.49	2.32	12	10.58	2.34	958
Total	10.66	2.34	521	11.02	2.41	543	11.60	2.45	489	11.77	2.49	396	11.81	2.06	22	11.23	2.45	1971

Interventricular Septum Systolic Thickness (IVSs) (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	14.97	2.45	269	15.24	2.50	276	15.92	2.54	260	16.01	2.72	198	15.42	2.41	10	15.50	2.57	1013
Female	13.01	2.08	252	13.57	2.40	267	14.47	2.60	229	15.00	2.43	198	14.76	2.20	12	13.95	2.49	958
Total	14.02	2.48	521	14.42	2.59	543	15.24	2.67	489	15.51	2.63	396	15.06	2.26	22	14.74	2.65	1971

Left Ventricular End-diastolic Volume (LVEdV) (ml)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	110.07	23.78	269	108.11	23.21	276	106.71	23.74	260	101.19	24.38	198	103.34	22.60	10	106.87	23.88	1013
Female	90.61	17.69	252	92.20	20.31	267	92.95	20.97	229	92.03	23.24	198	90.21	18.14	12	91.90	20.43	958
Total	100.66	23.18	521	100.29	23.22	543	100.26	23.49	489	96.61	24.23	396	96.18	20.89	22	99.59	23.49	1971

Left Ventricular End-systolic Volume (LVEsV) (ml)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	39.51	13.56	269	37.52	12.90	276	37.22	14.21	260	33.63	14.72	198	39.98	11.63	10	37.23	13.89	1013
Female	29.80	9.57	252	29.37	11.82	267	28.59	11.86	229	31.50	15.07	198	30.19	19.18	12	29.75	12.18	958
Total	34.81	12.75	521	33.52	13.02	543	33.18	13.84	489	32.57	14.92	396	34.64	16.60	22	33.60	13.61	1971

Stroke Volume (SV) (ml)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	70.80	15.89	269	70.83	15.57	276	69.75	16.84	260	67.77	15.24	198	63.54	15.03	10	69.87	15.95	1013
Female	60.95	13.11	252	62.94	13.56	267	64.50	14.16	229	60.62	14.27	198	60.22	17.03	12	62.27	13.84	958
Total	66.04	15.41	521	66.95	15.13	543	67.29	15.84	489	64.19	15.17	396	61.73	15.86	22	66.18	15.43	1971

Cardiac Output (CO) (l/min)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	4.35	1.06	269	4.36	0.99	275	4.31	1.03	258	4.21	1.08	195	4.01	0.44	9	4.31	1.04	1006
Female	3.88	0.95	252	3.93	0.96	267	4.05	0.99	228	3.99	1.02	196	3.91	1.25	12	3.96	0.98	955
Total	4.12	1.04	521	4.15	1.00	542	4.19	1.02	486	4.10	1.06	391	3.96	0.97	21	4.14	1.02	1961

Ejection Fraction (EF) (%)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	64.44	7.81	269	65.73	7.71	276	65.59	8.98	260	67.63	8.89	198	61.58	7.02	10	65.68	8.37	1013
Female	67.29	7.36	252	68.64	7.88	267	69.86	8.18	229	66.79	10.09	198	67.55	17.24	12	68.18	8.55	958
Total	65.82	7.72	521	67.16	7.92	543	67.59	8.87	489	67.21	9.50	396	64.84	13.64	22	66.90	8.55	1971

Fractional Shortening (FS) (%)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	35.56	6.05	269	36.50	5.96	276	36.50	6.82	260	38.05	6.97	198	33.25	5.07	10	36.52	6.46	1013
Female	37.49	5.77	252	38.67	6.34	267	39.70	6.67	229	37.40	7.79	198	38.96	12.72	12	38.35	6.76	958
Total	36.49	5.99	521	37.57	6.24	543	38.00	6.93	489	37.73	7.39	396	36.36	10.21	22	37.41	6.67	1971

Heart Rate (HR) (/min)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	62.0	9.0	272	62.1	8.6	293	62.6	10.1	289	63.5	11.6	269	63.6	9.3	16	62.6	9.9	1139
Female	64.0	9.7	261	63.0	9.6	284	63.8	10.1	269	66.3	10.1	263	67.1	11.0	21	64.3	9.9	1098
Total	63.0	9.4	533	62.5	9.1	577	63.2	10.1	558	64.9	10.9	532	65.6	10.3	37	63.4	9.9	2237

5. Intima-media thickness of carotid artery

(Ultrasonic tomography, EUB-655, Hitachi Medical Corp.,)

Intima-media Thickness of Left Common Carotid Artery (the Thickest Point) (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.69	0.21	273	0.81	0.31	295	0.91	0.31	290	1.02	0.40	274	1.16	0.40	17	0.86	0.34	1149
Female	0.65	0.16	260	0.78	0.23	282	0.87	0.25	270	0.98	0.33	268	0.99	0.18	22	0.83	0.28	1102
Total	0.67	0.19	533	0.80	0.28	577	0.89	0.29	560	1.00	0.37	542	1.07	0.30	39	0.84	0.31	2251

Intima-media Thickness of Left Common Carotid Artery (the Thinnest Point) (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.54	0.14	273	0.60	0.16	295	0.66	0.16	290	0.72	0.18	274	0.92	0.31	17	0.63	0.18	1149
Female	0.52	0.12	260	0.62	0.16	282	0.66	0.16	270	0.72	0.19	268	0.71	0.15	22	0.63	0.17	1102
Total	0.53	0.13	533	0.61	0.16	577	0.66	0.16	560	0.72	0.19	542	0.80	0.25	39	0.63	0.18	2251

Intima-media Thickness of Left Carotid Sinus (the Thickest Point) (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.97	0.34	257	1.13	0.49	272	1.33	0.67	273	1.55	0.80	266	1.38	0.60	17	1.25	0.64	1085
Female	0.91	0.26	245	1.06	0.32	262	1.18	0.40	250	1.38	0.65	252	1.38	0.62	21	1.14	0.47	1030
Total	0.94	0.30	502	1.10	0.42	534	1.25	0.56	523	1.47	0.74	518	1.38	0.60	38	1.19	0.57	2115

Intima-media Thickness of Left Carotid Sinus (the Thinnest Point) (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.63	0.17	257	0.69	0.18	272	0.75	0.19	273	0.84	0.27	266	0.87	0.21	17	0.73	0.22	1085
Female	0.62	0.15	245	0.69	0.18	262	0.74	0.19	250	0.80	0.23	252	0.80	0.30	21	0.72	0.21	1030
Total	0.63	0.16	502	0.69	0.18	534	0.75	0.19	523	0.82	0.25	518	0.83	0.26	38	0.72	0.21	2115

Intima-media Thickness of Right Common Carotid Artery (the Thickest Point) (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.65	0.18	272	0.73	0.23	293	0.86	0.34	290	0.93	0.36	273	1.16	0.53	17	0.80	0.31	1145
Female	0.61	0.14	260	0.70	0.17	284	0.81	0.21	269	0.92	0.27	268	0.99	0.24	22	0.76	0.24	1103
Total	0.63	0.16	532	0.71	0.20	577	0.83	0.29	559	0.92	0.32	541	1.06	0.40	39	0.78	0.28	2248

Intima-media Thickness of Right Common Carotid Artery (the Thinnest Point) (mm)

[illegible]

Male	0.50	0.11	272	0.55	0.13	293	0.62	0.15	290	0.67	0.15	273	0.77	0.17	17	0.59	0.15	1145
Female	0.49	0.11	260	0.55	0.12	284	0.61	0.13	269	0.69	0.15	268	0.67	0.16	22	0.59	0.15	1103
Total	0.50	0.11	532	0.55	0.12	577	0.62	0.14	559	0.68	0.15	541	0.72	0.17	39	0.59	0.15	2248

Intima-media Thickness of Right Carotid Sinus (the Thickest Point) (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	1.00	0.30	261	1.15	0.54	284	1.34	0.70	284	1.44	0.76	272	1.53	0.78	17	1.24	0.63	1118
Female	0.91	0.23	257	1.01	0.26	275	1.16	0.47	260	1.34	0.60	257	1.39	0.67	22	1.11	0.46	1071
Total	0.95	0.27	518	1.08	0.43	559	1.25	0.60	544	1.39	0.69	529	1.45	0.72	39	1.18	0.56	2189

Intima-media Thickness of Right Carotid Sinus (the Thinnest Point) (mm)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.65	0.17	261	0.70	0.19	284	0.76	0.22	284	0.81	0.31	272	0.84	0.21	17	0.73	0.24	1118
Female	0.62	0.17	257	0.68	0.18	275	0.72	0.21	260	0.77	0.24	257	0.78	0.24	22	0.70	0.21	1071
Total	0.63	0.17	518	0.69	0.19	559	0.74	0.22	544	0.79	0.28	529	0.80	0.23	39	0.71	0.23	2189

2) Respiratory system

1. Pulmonary functions

(Electropirometer, Chestgraph H1701, Chest, Inc.,)

Vital Capacity(VC) (L)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	4.303	0.553	273	3.890	0.610	295	3.481	0.582	290	2.987	0.599	274	2.680	0.554	17	3.652	0.765	1149
Female	3.010	0.439	261	2.749	0.375	284	2.458	0.401	271	2.088	0.405	264	1.678	0.355	22	2.559	0.540	1102
Total	3.671	0.818	534	3.330	0.764	579	2.987	0.717	561	2.546	0.682	538	2.115	0.673	39	3.117	0.860	2251

Inspiratory Capacity(IC) (L)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	2.752	0.509	270	2.564	0.566	288	2.268	0.550	280	1.894	0.512	268	1.856	0.421	16	2.365	0.624	1122
Female	1.938	0.413	258	1.782	0.392	280	1.737	0.415	270	1.500	0.415	253	1.214	0.371	21	1.731	0.441	1082
Total	2.354	0.618	528	2.178	0.625	568	2.007	0.556	550	1.703	0.507	521	1.492	0.504	37	2.054	0.628	2204

Tidal Volume(TV) (L)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.815	0.321	270	0.768	0.351	288	0.729	0.330	280	0.649	0.293	268	0.578	0.275	16	0.739	0.330	1122
Female	0.576	0.257	258	0.476	0.209	280	0.505	0.239	270	0.496	0.236	253	0.482	0.209	21	0.512	0.238	1082

Total	0. 698	0. 315	528	0. 624	0. 324	568	0. 619	0. 310	550	0. 575	0. 277	521	0. 524	0. 241	37	0. 627	0. 310	2204
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Expiratory Reserve Volume (ERV) (L)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	1. 534	0. 453	270	1. 316	0. 467	288	1. 214	0. 462	280	1. 097	0. 443	268	0. 831	0. 440	16	1. 284	0. 485	1122
Female	1. 058	0. 343	258	0. 947	0. 334	280	0. 715	0. 310	270	0. 589	0. 276	253	0. 465	0. 212	21	0. 822	0. 367	1082
Total	1. 301	0. 468	528	1. 134	0. 446	568	0. 969	0. 467	550	0. 850	0. 450	521	0. 623	0. 373	37	1. 057	0. 489	2204

Inspiratory Reserve Volume (IRV) (L)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	1. 937	0. 489	270	1. 796	0. 540	288	1. 538	0. 521	280	1. 247	0. 508	268	1. 278	0. 374	16	1. 627	0. 576	1122
Female	1. 363	0. 391	258	1. 305	0. 371	280	1. 228	0. 383	270	1. 000	0. 394	253	0. 732	0. 315	21	1. 217	0. 411	1082
Total	1. 656	0. 528	528	1. 554	0. 525	568	1. 386	0. 483	550	1. 127	0. 472	521	0. 968	0. 434	37	1. 426	0. 542	2204

Forced Vital Capacity (FVC) (L)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	3. 938	0. 543	273	3. 472	0. 622	295	3. 078	0. 583	290	2. 591	0. 566	274	2. 198	0. 606	17	3. 254	0. 767	1149
Female	2. 764	0. 426	260	2. 481	0. 379	284	2. 186	0. 384	271	1. 823	0. 387	263	1. 483	0. 349	22	2. 298	0. 533	1100
Total	3. 365	0. 765	533	2. 986	0. 716	579	2. 647	0. 667	561	2. 215	0. 620	537	1. 794	0. 592	39	2. 786	0. 818	2249

1 Second Forced Expiratory Volume (FEV1.0) (L)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	3. 420	0. 461	273	2. 976	0. 522	295	2. 587	0. 521	290	2. 122	0. 513	274	1. 774	0. 481	17	2. 762	0. 699	1149
Female	2. 460	0. 376	260	2. 176	0. 330	284	1. 906	0. 330	271	1. 561	0. 340	263	1. 231	0. 324	22	2. 011	0. 486	1100
Total	2. 952	0. 639	533	2. 584	0. 594	579	2. 258	0. 556	561	1. 847	0. 519	537	1. 468	0. 479	39	2. 394	0. 711	2249

% of 1 Second Forced Expiratory Volume (Gaensler) (FEV1.0%G) (%)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	86. 93	6. 26	273	86. 00	6. 36	295	84. 07	7. 65	290	81. 76	9. 19	274	81. 62	10. 63	17	84. 66	7. 75	1149
Female	89. 26	6. 39	260	87. 95	6. 52	284	87. 45	6. 54	271	85. 74	7. 83	263	82. 77	7. 73	22	87. 50	6. 99	1100
Total	88. 07	6. 42	533	86. 96	6. 51	579	85. 70	7. 33	561	83. 71	8. 78	537	82. 27	9. 00	39	86. 05	7. 52	2249

% of 1 Second Forced Expiratory Volume (Tiffeneau) (FEV1.0%T) (L)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	79. 69	7. 07	273	76. 61	7. 45	295	74. 17	8. 27	290	70. 88	10. 56	274	66. 49	12. 80	17	75. 21	9. 12	1149
Female	81. 77	6. 22	260	79. 28	7. 11	283	77. 70	7. 31	271	74. 88	9. 73	263	73. 19	9. 92	22	78. 30	8. 14	1099

Total	80.70	6.74	533	77.92	7.40	578	75.88	8.01	561	72.84	10.35	537	70.27	11.61	39	76.72	8.79	2248
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Maximal Midexpiratory Flow(MMF) (L/s)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	4.148	1.062	273	3.501	0.986	295	2.966	1.094	290	2.313	0.992	274	1.991	0.882	17	3.214	1.234	1149
Female	3.236	0.887	260	2.840	0.818	284	2.483	0.756	271	1.951	0.721	263	1.423	0.623	22	2.605	0.934	1100
Total	3.703	1.081	533	3.177	0.965	579	2.733	0.975	561	2.136	0.888	537	1.671	0.789	39	2.916	1.139	2249

Peak Flow(PEF) (L/s)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	8.340	1.766	273	7.538	1.670	295	6.589	1.802	290	5.275	1.883	274	4.804	1.509	17	6.909	2.113	1149
Female	5.559	1.266	260	5.064	1.235	284	4.595	1.144	271	3.773	1.180	263	2.895	1.145	22	4.713	1.389	1100
Total	6.983	2.077	533	6.324	1.923	579	5.626	1.817	561	4.540	1.746	537	3.727	1.613	39	5.835	2.104	2249

V75(L/s)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	7.733	1.907	273	7.055	1.782	295	6.191	1.911	290	4.833	1.968	274	4.290	1.836	17	6.427	2.181	1149
Female	5.360	1.325	260	4.864	1.311	284	4.381	1.224	271	3.554	1.237	263	2.774	1.163	22	4.507	1.450	1100
Total	6.575	2.031	533	5.980	1.913	579	5.317	1.851	561	4.206	1.769	537	3.435	1.658	39	5.488	2.092	2249

V50(L/s)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	4.830	1.306	273	4.198	1.253	295	3.608	1.347	290	2.886	1.273	274	2.486	1.140	17	3.861	1.480	1149
Female	3.790	1.017	260	3.438	1.007	284	3.079	0.940	271	2.459	0.935	263	1.778	0.751	22	3.165	1.101	1100
Total	4.323	1.283	533	3.825	1.200	579	3.352	1.197	561	2.677	1.140	537	2.086	0.993	39	3.521	1.354	2249

V25(L/s)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	2.065	0.714	273	1.627	0.585	295	1.351	0.657	290	1.043	0.550	274	0.891	0.433	17	1.512	0.730	1149
Female	1.689	0.689	260	1.369	0.563	284	1.158	0.488	271	0.900	0.414	263	0.662	0.371	22	1.267	0.619	1100
Total	1.882	0.726	533	1.501	0.588	579	1.258	0.589	561	0.973	0.493	537	0.762	0.410	39	1.392	0.688	2249

Peak Flow Time(sec)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.106	0.065	273	0.108	0.068	295	0.112	0.058	290	0.136	0.098	274	0.101	0.047	17	0.115	0.074	1149

Female	0.132	0.078	260	0.139	0.087	284	0.133	0.079	271	0.144	0.089	263	0.185	0.141	22	0.138	0.085	1100
Total	0.118	0.073	533	0.123	0.080	579	0.122	0.070	561	0.140	0.093	537	0.148	0.117	39	0.126	0.080	2249

Extrap V (%)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	3.93	2.19	273	4.31	2.08	295	4.78	2.37	290	5.73	3.59	274	4.88	3.03	17	4.69	2.70	1149
Female	4.45	2.41	260	4.95	2.60	284	5.36	2.95	271	6.14	3.56	263	6.41	2.63	22	5.24	2.97	1100
Total	4.18	2.31	533	4.62	2.37	579	5.06	2.68	561	5.93	3.58	537	5.74	2.88	39	4.96	2.85	2249

2. Blood oxygen saturation

(Pulse oximeter, Model9500 Oximeter, Nonin Medical, Inc.,)

O2 Saturation(%O2)

	40 – 49yr			50 – 59yr			60 – 69yr			70 – 79yr			80yr –			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	96.8	1.3	272	96.7	1.3	295	96.1	1.5	289	95.7	1.5	271	95.9	1.4	17	96.3	1.5	1144
Female	97.6	1.2	259	96.9	1.3	283	96.3	1.4	270	96.0	1.3	267	95.4	1.4	22	96.7	1.4	1101
Total	97.2	1.3	531	96.8	1.3	578	96.2	1.4	559	95.8	1.4	538	95.6	1.4	39	96.5	1.5	2245