



## Physical Fitness Norms

This section contains the normative data charts developed for many of the assessments in this text section. Normative data is collected on a specific population of people, which is then ranked or separated into fitness categories according to performance. This ranking does not tell an individual where they need to be; it only represents how they scored relative to others of a similar age, gender, weight, etc. For a detailed explanation of percentile rankings and how they relate to the fitness categories, see the Goal Setting section.

### Body Fat Norms (Cooper Institute)

- Based Upon Skinfolts

### Explosive Leg Power Norms (Law Enforcement Studies)

- Vertical Jump (inches)

### Absolute Strength Norms (Cooper Institute)

- 1 Repetition Maximum Bench Press Ratio  
(the score is weight pushed in pounds divided by body weight in pounds)

### Dynamic Strength (muscular endurance) Norms (Cooper Institute)

- 1 Minute Sit-Up Test

### Anaerobic Power Norms (Law Enforcement Studies)

- 300 Meter Run (seconds)

### Dynamic Strength (muscular endurance) Norms (Cooper Institute)

- 1 Minute Push-Up Test

### Cardiorespiratory Fitness Norms (Cooper Institute)

#### Four Tests

- Balke Treadmill (time)
- 1 Mile Walk ( $\dot{V}O_2$  max)
- $\dot{V}O_2$  max (ml/kg/min.)
- 12 Minute Run (distance)
- 1.5 Mile Run (time)

### Flexibility Norms (Cooper Institute)

- Sit-and-Reach Test (inches)

### Agility Norms

- Illinois Agility Run (no age based norms – see data for Law Enforcement)

Note: Cooper Institute norms are available in *Physical Fitness Assessments and Norms for Adults and Law Enforcement*.

### *Fitness Categories*

Superior	= S	= 95 percentile and higher
Excellent	= E	= 80 – 94 percentile
Good	= G	= 60 – 79 percentile
Fair	= F	= 40 – 59 percentile
Poor	= P	= 20 – 39 percentile
Very Poor	= VP	= <20 percentile





## BODY COMPOSITION (Skinfold Method)

### Males

#### AGE

%	20-29	30-39	40-49	50-59	60-69	70-79	
99	4.2	7.3	9.5	11.1	12.0	13.6	
95	6.4	10.3	13.0	14.9	16.1	15.5	VI*
90	7.9	12.5	15.0	17.0	18.1	17.5	
85	9.1	13.8	16.4	18.3	19.2	19.0	
80	10.5	14.9	17.5	19.4	20.2	20.2	E
75	11.5	15.9	18.5	20.2	21.0	21.1	
70	12.6	16.8	19.3	21.0	21.7	21.6	
65	13.8	17.7	20.1	21.7	22.4	22.3	
60	14.8	18.4	20.8	22.3	23.0	22.9	G
55	15.8	19.2	21.4	23.0	23.6	23.6	
50	16.7	20.0	22.1	23.6	24.2	24.1	
45	17.5	20.7	22.8	24.2	24.9	24.5	
40	18.6	21.6	23.5	24.9	25.6	25.2	F
35	19.8	22.4	24.2	25.6	26.4	25.7	
30	20.7	23.2	24.9	26.3	27.0	26.3	
25	22.1	24.1	25.7	27.1	27.9	27.1	
20	23.3	25.1	26.6	28.1	28.8	28.0	P
15	25.1	26.4	27.7	29.2	29.8	29.3	
10	26.6	27.8	29.1	30.6	31.2	30.6	
5	29.3	30.2	31.2	32.7	33.5	32.9	
1	33.7	34.4	35.2	36.4	37.2	37.3	VP
	n=1,938	n=10,457	n=16,032	n=9,976	n=3,097	n=571	

Total n = 42,071

\*Very Lean – No less than 3% body fat is recommended for males.

Updated: 2013

Norms based on Cooper Clinic patients



## EXPLOSIVE LEG POWER

### Vertical Jump Test

#### Males

#### AGE

%	20-29	30-39	40-49	50-59	
99	30.3	28.4	25.1	22.0	
95	26.5	25.0	22.0	21.0	<b>S</b>
90	25.0	24.0	20.3	19.5	
85	25.0	23.0	19.5	18.0	
80	24.0	22.0	19.0	17.0	<b>E</b>
75	23.0	21.0	18.0	16.5	
70	22.5	21.0	18.0	16.0	
65	22.0	20.0	17.0	15.5	
60	21.5	20.0	17.0	15.0	<b>G</b>
55	21.0	20.0	16.5	14.5	
50	20.5	19.5	16.0	14.0	
45	20.0	19.0	16.0	14.0	
40	20.0	18.6	15.5	13.5	<b>F</b>
35	19.0	18.5	15.0	13.5	
30	18.0	18.0	14.5	13.0	
25	18.0	17.0	14.0	12.2	
20	17.5	16.5	14.0	11.9	<b>P</b>
15	17.0	16.0	13.0	11.0	
10	16.0	15.5	12.1	10.0	
5	13.6	14.5	11.0	9.3	
1	10.3	12.1	6.9	6.5	<b>VP</b>

Data represents law enforcement validation studies



## ABSOLUTE STRENGTH

### 1 Repetition Maximum Bench Press Test

#### Males

Bench Press Weight Ratio =  $\frac{\text{weight pushed in lbs. on DVR bench press}}{\text{body weight in lbs.}}$

#### AGE

%	<20	20-29	30-39	40-49	50-59	60+	
99	>1.76	>1.63	>1.35	>1.20	>1.05	>.94	
95	1.76	1.63	1.35	1.20	1.05	.94	<b>S</b>
90	1.46	1.48	1.24	1.10	.97	.89	
85	1.38	1.37	1.17	1.04	.93	.84	
80	1.34	1.32	1.12	1.00	.90	.82	<b>E</b>
75	1.29	1.26	1.08	.96	.87	.79	
70	1.24	1.22	1.04	.93	.84	.77	
65	1.23	1.18	1.01	.90	.81	.74	
60	1.19	1.14	.98	.88	.79	.72	<b>G</b>
55	1.16	1.10	.96	.86	.77	.70	
50	1.13	1.06	.93	.84	.75	.68	
45	1.10	1.03	.90	.82	.73	.67	
40	1.06	.99	.88	.80	.71	.66	<b>F</b>
35	1.01	.96	.86	.78	.70	.65	
30	.96	.93	.83	.76	.68	.63	
25	.93	.90	.81	.74	.66	.60	
20	.89	.88	.78	.72	.63	.57	<b>P</b>
15	.86	.84	.75	.69	.60	.56	
10	.81	.80	.71	.65	.57	.53	
5	.76	.72	.65	.59	.53	.49	
1	<.76	<.72	<.65	<.59	<.53	<.49	<b>VP</b>
	n=60	n=425	n=1,909	n=2,090	n=1,279	n=343	

Total n = 6,106

Norms are based on Cooper Clinic patients



## DYNAMIC STRENGTH

### 1 Minute Sit-Up Test

#### Males

#### AGE

%	<20	20-29	30-39	40-49	50-59	60+	
99	>62.0	>55.0	>51.0	>47.0	>43.0	>39.0	
95	62.0	55.0	51.0	47.0	43.0	39.0	<b>S</b>
90	55.0	52.0	48.0	43.0	39.0	35.0	
85	53.0	49.0	45.0	40.0	36.0	31.0	
80	51.0	47.0	43.0	39.0	35.0	30.0	<b>E</b>
75	50.0	46.0	42.0	37.0	33.0	28.0	
70	48.0	45.0	41.0	36.0	31.0	26.0	
65	48.0	44.0	40.0	35.0	30.0	24.0	
60	47.0	42.0	39.0	34.0	28.0	22.0	<b>G</b>
55	46.0	41.0	37.0	32.0	27.0	21.0	
50	45.0	40.0	36.0	31.0	26.0	20.0	
45	42.0	39.0	36.0	30.0	25.0	19.0	
40	41.0	38.0	35.0	29.0	24.0	19.0	<b>F</b>
35	39.0	37.0	33.0	28.0	22.0	18.0	
30	38.0	35.0	32.0	27.0	21.0	17.0	
25	37.0	35.0	31.0	26.0	20.0	16.0	
20	36.0	33.0	30.0	24.0	19.0	15.0	<b>P</b>
15	34.0	32.0	28.0	22.0	17.0	13.0	
10	33.0	30.0	26.0	22.0	15.0	10.0	
5	27.0	27.0	23.0	17.0	12.0	7.0	
1	<27.0	<27.0	<23.0	<17.0	<12.0	<7.0	<b>VP</b>
	n=46	n=312	n=1,431	n=1,558	n=919	n=205	

Total n = 4,471

Norms are based on Cooper Clinic patients



## ANAEROBIC POWER 300 Meter Run Test

### Males

### AGE

%	20-29	30-39	40-49	50-59	
99	42.6	42.0	47.0	52.0	
95	46.0	46.1	52.0	58.0	<b>S</b>
90	48.0	49.0	55.0	61.0	
85	49.0	50.0	56.0	63.0	
80	50.3	51.0	57.0	66.4	<b>E</b>
75	51.0	52.0	60.0	68.0	
70	52.0	53.0	61.0	70.0	
65	53.5	54.0	62.0	72.0	
60	54.0	55.0	64.0	74.0	<b>G</b>
55	55.0	56.0	66.0	77.4	
50	56.0	57.0	67.6	80.0	
45	57.5	58.0	70.0	82.6	
40	59.0	58.9	72.0	83.2	<b>F</b>
35	60.0	61.0	74.8	85.0	
30	62.1	63.0	77.0	87.0	
25	64.0	65.0	81.0	89.0	
20	66.0	68.0	83.0	95.0	<b>P</b>
15	69.0	70.0	86.0	99.0	
10	73.4	74.9	90.0	101.6	
5	81.3	80.9	104.0	112.0	
1	95.1	113.9	143.0	184.0	<b>VP</b>

Data represents law enforcement validation studies



## DYNAMIC STRENGTH

### 1 Minute Push-Up Test

#### Males

#### AGE

%	20-29	30-39	40-49	50-59	60+	
99	100	86	64	51	39	
95	62	52	40	39	28	<b>S</b>
90	57	46	36	30	26	
85	51	41	34	28	24	
80	47	39	30	25	23	<b>E</b>
75	44	36	29	24	22	
70	41	34	26	21	21	
65	39	31	25	20	20	
60	37	30	24	19	18	<b>G</b>
55	35	29	22	17	16	
50	33	27	21	15	15	
45	31	25	19	14	12	
40	29	24	18	13	10	<b>F</b>
35	27	21	16	11	9	
30	26	20	15	10	8	
25	24	19	13	9.5	7	
20	22	17	11	9	6	<b>P</b>
15	19	15	10	7	5	
10	18	13	9	6	4	
5	13	9	5	3	2	<b>VP</b>
	n=1,045	n=790	n=364	n=172	n=26	

Total n = 2,397

Norms are based on members of employee wellness program





## CARDIORESPIRATORY FITNESS TESTS

### Males

%	AGE 20-29				AGE 30-39			
	Balke Treadmill (time)	$\dot{V}O_2$ max (ml/kg/min.)	12 min. Run Distance (miles)	1.5 Mile Run (time)	Balke Treadmill (time)	$\dot{V}O_2$ max (ml/kg/min.)	12 min. Run Distance (miles)	1.5 Mile Run (time)
99	31:03	59.8	1.98	8:35	30:00	58.3	1.93	8:49
95	28:01	55.4	1.86	9:18	27:02	54.0	1.82	9:34 <b>S</b>
90	26:40	53.5	1.80	9:40	25:22	51.6	1.75	10:02
85	25:30	51.8	1.75	10:00	24:12	49.9	1.70	10:24
80	25:00	51.1	1.73	10:09	23:03	48.3	1.66	10:47 <b>E</b>
75	23:09	48.4	1.66	10:45	22:10	47.0	1.62	11:06
70	22:30	47.5	1.63	10:59	21:30	46.0	1.59	11:22
65	22:00	46.8	1.61	11:10	21:00	45.3	1.57	11:33
60	21:05	45.4	1.58	11:31	20:05	44.0	1.54	11:56 <b>G</b>
55	20:30	44.6	1.55	11:45	20:00	43.9	1.53	11:58
50	20:00	43.9	1.53	11:58	19:00	42.4	1.49	12:25
45	19:02	42.5	1.49	12:23	18:05	41.1	1.46	12:50
40	18:30	41.7	1.47	12:38	17:39	40.5	1.44	13:04 <b>F</b>
35	18:00	41.0	1.45	12:53	17:00	39.5	1.41	13:24
30	17:15	39.9	1.42	13:16	16:20	38.6	1.39	13:46
25	16:31	38.8	1.39	13:40	15:41	37.6	1.36	14:09
20	15:46	37.8	1.36	14:06	15:00	36.7	1.33	14:34 <b>P</b>
15	15:00	36.7	1.33	14:34	14:01	35.2	1.29	15:13
10	13:31	34.5	1.27	15:35	13:00	33.8	1.25	15:58
5	11:18	31.3	1.18	17:22	11:11	31.1	1.18	17:29
1	7:40	26.1	1.04	21:25	8:00	26.5	1.05	20:58 <b>VP</b>

n=2,463

n=13,308

Updated: 2013

Norms are based on Cooper Clinic patients



## CARDIORESPIRATORY FITNESS TESTS

### Males

%	AGE 40-49				AGE 50-59				
	Balke Treadmill (time)	$\dot{V}O_2$ max (ml/kg/min.)	12 min. Run Distance (miles)	1.5 Mile Run (time)	Balke Treadmill (time)	$\dot{V}O_2$ max (ml/kg/min.)	12 min. Run Distance (miles)	1.5 Mile Run (time)	
99	28:30	56.1	1.87	9:10	27:00	54.0	1.81	9:34	
95	26:00	52.5	1.77	9:51	23:31	49.0	1.67	10:38	S
90	24:00	49.7	1.69	10:28	24:56	46.7	1.61	11:11	
85	23:00	48.2	1.65	10:48	20:31	44.6	1.55	11:45	
80	21:44	46.4	1.60	11:16	19:39	43.4	1.52	12:07	E
75	20:41	44.9	1.56	11:41	18:36	41.9	1.48	12:36	
70	20:01	43.9	1.53	11:58	18:00	41.0	1.45	12:53	
65	19:30	43.2	1.51	12:11	17:14	39.9	1.42	13:17	
60	19:00	42.4	1.49	12:25	16:45	39.2	1.40	13:32	G
55	18:00	41.0	1.45	12:53	16:01	38.1	1.37	13:57	
50	17:25	40.1	1.43	13:11	15:29	37.4	1.35	14:16	
45	17:00	39.5	1.41	13:24	15:00	36.7	1.33	14:34	
40	16:15	38.5	1.38	13:49	14:16	35.6	1.30	15:03	F
35	15:45	37.7	1.36	14:07	13:52	35.0	1.29	15:20	
30	15:01	36.7	1.33	14:34	13:00	33.8	1.25	15:58	
25	14:30	35.9	1.31	14:53	12:30	33.0	1.23	16:21	
20	13:48	34.9	1.28	15:22	12:00	32.3	1.21	16:46	P
15	13:00	33.8	1.25	15:58	11:00	30.9	1.17	17:38	
10	12:00	32.3	1.21	16:46	10:00	29.4	1.13	18:38	
5	10:01	29.5	1.13	18:37	8:20	27.0	1.07	20:53	
1	7:01	25.1	1.01	22:20	5:25	22.8	0.95	25:01	VP

n=19,566

n=11,693

Updated: 2013



## CARDIORESPIRATORY FITNESS TESTS

### Males

%	AGE 60-69				AGE 70-79			
	Balke Treadmill (time)	$\dot{V}O_2$ max (ml/kg/min.)	12 min. Run Distance (miles)	1.5 Mile Run (time)	Balke Treadmill (time)	$\dot{V}O_2$ max (ml/kg/min.)	12 min. Run Distance (miles)	1.5 Mile Run (time)
99	25:00	51.1	1.73	10:09	24:00	49.7	1.69	10:28
95	21:18	45.8	1.59	11:26	18:45	42.1	1.48	12:31 <b>S</b>
90	19:08	42.6	1.50	12:21	17:00	39.5	1.41	13:24
85	18:00	41.0	1.45	12:53	16:00	38.1	1.37	13:58
80	17:01	39.6	1.41	13:23	15:00	36.7	1.33	14:34 <b>E</b>
75	16:07	38.3	1.38	13:53	14:01	35.2	1.29	15:13
70	15:29	37.4	1.35	14:16	13:05	33.9	1.26	15:54
65	15:00	36.7	1.33	14:34	12:33	33.1	1.23	16:19
60	14:14	35.5	1.30	15:04	12:01	32.3	1.21	16:45 <b>G</b>
55	13:45	34.9	1.28	15:25	11:26	31.5	1.19	17:15
50	13:02	33.8	1.25	15:56	10:51	30.7	1.17	17:47
45	12:30	33.0	1.23	16:21	10:21	29.9	1.15	18:16
40	12:00	32.3	1.21	16:46	10:00	29.4	1.13	18:38 <b>F</b>
35	11:30	31.6	1.19	17:11	9:04	28.1	1.09	19:39
30	11:00	30.9	1.17	17:38	8:52	27.8	1.09	19:53
25	10:05	29.6	1.14	18:32	8:05	26.7	1.06	20:51
20	9:30	28.7	1.11	19:10	7:24	25.7	1.03	21:47 <b>P</b>
15	8:36	27.4	1.08	20:12	6:39	24.6	1.00	22:54
10	7:26	25.7	1.03	21:44	5:30	22.9	0.95	24:52
5	6:00	23.7	0.97	23:58	4:01	20.8	0.89	27:56
1	3:05	19.4	0.85	6:18	2:15	18.2	0.82	32:46 <b>VP</b>

n=3,285

n=467

Updated: 2013



## FLEXIBILITY

### Sit-and-Reach Test

#### Males

#### AGE

%	<20	20-29	30-39	40-49	50-59	60+	
99	> 23.4	>23.0	>22.0	>21.3	>20.5	>20.0	
95	23.4	23.0	22.0	21.3	20.5	20.0	<b>S</b>
90	22.6	21.8	21.0	20.0	19.0	19.0	
85	22.4	21.0	20.0	19.3	18.3	18.0	
80	21.7	20.5	19.5	18.5	17.5	17.3	<b>E</b>
75	21.4	20.0	19.0	18.0	17.0	16.5	
70	20.7	19.5	18.5	17.5	16.5	15.5	
65	19.8	19.0	18.0	17.0	16.0	15.0	
60	19.0	18.5	17.5	16.3	15.5	14.5	<b>G</b>
55	18.7	18.0	17.0	16.0	15.0	14.0	
50	18.0	17.5	16.5	15.3	14.5	13.5	
45	17.3	17.0	16.0	15.0	14.0	13.0	
40	16.5	16.5	15.5	14.3	13.3	12.5	<b>F</b>
35	16.0	16.0	15.0	14.0	12.5	12.0	
30	15.5	15.5	14.5	13.3	12.0	11.3	
25	14.1	15.0	13.8	12.5	11.2	10.5	
20	13.2	14.4	13.0	12.0	10.5	10.0	<b>P</b>
15	11.9	13.5	12.0	11.0	9.7	9.0	
10	10.5	12.3	11.0	10.0	8.5	8.0	
5	9.4	10.5	9.3	8.3	7.0	5.8	
1	<9.4	<10.5	<9.3	<8.3	<7.0	<5.8	<b>VP</b>
	n=56	n=422	n=1,906	n=2,090	n=1,278	n=344	

Total n = 6,096

Norms are based on Cooper Clinic patients



## BODY COMPOSITION (Skinfold Method)

### Females

#### AGE

%	20-29	30-39	40-49	50-59	60-69	70-79	
99	11.4	11.0	11.7	13.5	13.8	13.7	
95	14.1	13.8	15.2	16.9	17.7	16.4	VL*
90	15.2	15.5	16.8	19.1	20.1	18.8	
85	16.1	16.5	18.2	20.8	22.0	21.2	
80	16.8	17.5	19.5	22.3	23.2	22.6	E
75	17.7	18.3	20.5	23.5	24.5	23.7	
70	18.6	19.2	21.6	24.7	25.5	24.5	
65	19.2	20.1	22.6	25.7	26.6	25.4	
60	20.0	21.0	23.6	26.6	27.5	26.3	G
55	20.7	22.0	24.6	27.4	28.3	27.1	
50	21.8	22.9	25.5	28.3	29.2	27.8	
45	22.6	23.7	26.4	29.2	30.1	28.6	
40	23.5	24.8	27.4	30.0	30.8	30.0	F
35	24.4	25.8	28.3	30.7	31.5	30.9	
30	25.7	26.9	29.5	31.7	32.5	31.6	
25	26.9	28.1	30.7	32.8	33.3	32.6	
20	28.6	29.6	31.9	33.8	34.4	33.6	P
15	30.9	31.4	33.4	34.9	35.4	35.0	
10	33.8	33.6	35.0	36.0	36.6	36.1	
5	36.6	36.2	37.0	37.4	38.1	37.5	
1	38.4	39.0	39.0	39.8	40.3	40.0	VP
	n=1,342	n=4,376	n=6,392	n=4,496	n=1,576	n=325	

Total n = 18,507

\*Very Lean - No less than 10-13% body fat is recommended for females.

Updated: 2013

Norms based on Cooper Clinic patients



## EXPLOSIVE LEG POWER

### Vertical Jump Test

#### Females

#### AGE

%	20-29	30-39	40-49	50-59
99	19.0	18.0	13.5	NA
95	18.8	16.9	13.5	S
90	18.1	16.0	13.3	
85	18.0	15.5	13.0	
80	17.7	15.0	13.0	E
75	17.0	15.0	12.7	
70	16.3	14.9	12.3	
65	16.0	14.3	11.6	
60	15.9	13.2	11.5	G
55	15.5	13.0	11.1	
50	15.2	12.5	10.0	
45	14.3	12.4	10.0	
40	14.0	12.0	9.6	F
35	13.9	12.0	9.0	
30	13.5	11.1	9.0	
25	13.0	11.0	8.5	
20	12.6	11.0	7.8	P
15	12.0	10.9	7.1	
10	12.0	10.2	7.0	
5	11.4	9.1	7.0	
1	11.0	6.0	7.0	VP

Data represents law enforcement validation studies



## ABSOLUTE STRENGTH

### 1 Repetition Maximum Bench Press Test

$$\text{Bench Press Weight Ratio} = \frac{\text{weight pushed in lbs. on DVR bench press}}{\text{body weight in lbs.}}$$

#### Females

#### AGE

%	<20	20-29	30-39	40-49	50-59	60+	
99	>.88	>1.01	>.82	>.77	>.68	>.72	
95	.88	1.01	.82	.77	.68	.72	<b>S</b>
90	.83	.90	.76	.71	.61	.64	
85	.81	.83	.72	.66	.57	.59	
80	.77	.80	.70	.62	.55	.54	<b>E</b>
75	.76	.77	.65	.60	.53	.53	
70	.74	.74	.63	.57	.52	.51	
65	.70	.72	.62	.55	.50	.48	
60	.65	.70	.60	.54	.48	.47	<b>G</b>
55	.64	.68	.58	.53	.47	.46	
50	.63	.65	.57	.52	.46	.45	
45	.60	.63	.55	.51	.45	.44	
40	.58	.59	.53	.50	.44	.43	<b>F</b>
35	.57	.58	.52	.48	.43	.41	
30	.56	.56	.51	.47	.42	.40	
25	.55	.53	.49	.45	.41	.39	
20	.53	.51	.47	.43	.39	.38	<b>P</b>
15	.52	.50	.45	.42	.38	.36	
10	.50	.48	.42	.38	.37	.33	
5	.41	.44	.39	.35	.31	.26	
1	<.41	<.44	<.39	<.35	<.31	<.26	<b>VP</b>
	n=20	n=191	n=379	n=333	n=189	n=42	

Total n = 1,154

Norms are based on Cooper Clinic patients



## DYNAMIC STRENGTH

### 1 Minute Sit-Up Test

#### Females

#### AGE

%	<20	20-29	30-39	40-49	50-59	60+	
99	>55.0	>51.0	>42.0	>38.0	>30.0	>28.0	
95	55.0	51.0	42.0	38.0	30.0	28.0	<b>S</b>
90	54.0	49.0	40.0	34.0	29.0	26.0	
85	49.0	45.0	38.0	32.0	25.0	20.0	
80	46.0	44.0	35.0	29.0	24.0	17.0	<b>E</b>
75	40.0	42.0	33.0	28.0	22.0	15.0	
70	38.0	41.0	32.0	27.0	22.0	12.0	
65	37.0	39.0	30.0	25.0	21.0	12.0	
60	36.0	38.0	29.0	24.0	20.0	11.0	<b>G</b>
55	35.0	37.0	28.0	23.0	19.0	10.0	
50	34.0	35.0	27.0	22.0	17.0	8.0	
45	34.0	34.0	26.0	21.0	16.0	8.0	
40	32.0	32.0	25.0	20.0	14.0	6.0	<b>F</b>
35	30.0	31.0	24.0	19.0	12.0	5.0	
30	29.0	30.0	22.0	17.0	12.0	4.0	
25	29.0	28.0	21.0	16.0	11.0	4.0	
20	28.0	24.0	20.0	14.0	10.0	3.0	<b>P</b>
15	27.0	23.0	18.0	13.0	7.0	2.0	
10	25.0	21.0	15.0	10.0	6.0	1.0	
5	25.0	18.0	11.0	7.0	5.0	0.0	
1	<25.0	<18.0	< 11.0	< 7.0	<5.0	0.0	<b>VP</b>
	n=15	n=144	n=289	n=249	n=137	n=26	

Total n = 860

Norms are based on Cooper Clinic patients





## ANAEROBIC POWER

### 300 Meter Run Test

#### Females

#### AGE

%	20-29	30-39	40-49	50-59	
99	54.0	55.0	65.0	NA	
95	54.3	56.5	65.0		S
90	56.0	60.0	66.0		
85	58.0	63.5	68.2		
80	58.3	66.0	72.0		E
75	59.7	66.5	72.0		
70	60.0	68.0	75.3		
65	61.0	69.9	78.7		
60	61.0	71.0	79.0		G
55	62.7	72.0	80.5		
50	64.0	74.0	86.0		
45	68.5	75.5	91.7		
40	71.0	79.0	94.0		F
35	74.5	80.5	101.8		
30	75.0	82.0	106.7		
25	76.0	85.5	109.3		
20	78.0	86.0	110.0		P
15	88.0	93.5	116.0		
10	97.0	100.0	121.5		
5	106.7	114.0	125.0		
1	120.0	210.0	125.0		VP

Data represents law enforcement validation studies



## DYNAMIC STRENGTH

### 1 Minute Modified Push-Up Test

#### Females

#### AGE

%	20-29	30-39	40-49	50-59	60+	
99	70	56	60	31	20	
95	45	39	33	28	20	S
90	42	36	28	25	17	
85	39	33	26	23	15	
80	36	31	24	21	15	E
75	34	29	21	20	15	
70	32	28	20	19	14	
65	31	26	19	18	13	
60	30	24	18	17	12	G
55	29	23	17	15	12	
50	26	21	15	13	8	
45	25	20	14	13	6	
40	23	19	13	12	5	F
35	22	17	11	10	4	
30	20	15	10	9	3	
25	19	14	9	8	2	
20	17	11	6	6	2	P
15	15	9	4	4	1	
10	12	8	2	1	0	
5	9	4	1	0	0	VP
	n=579	n=411	n=246	n=105	n=12	

Total n = 1,353

Norms are based on members of employees wellness program



## DYNAMIC STRENGTH

### 1 Minute Full Body Push-Up Test

#### Females

#### AGE

%	20-29	30-39	40-49	
99	53.0	48.0	23.0	
95	42.0	39.5	20.0	<b>S</b>
90	37.0	33.0	18.0	
85	33.0	26.0	17.0	
80	28.0	23.0	15.0	<b>E</b>
75	27.0	19.0	15.0	
70	24.0	18.0	14.0	
65	23.0	16.0	13.0	
60	21.0	15.0	13.0	<b>G</b>
55	19.0	14.0	11.0	
50	18.0	14.0	11.0	
45	17.0	13.0	10.0	
40	15.0	11.0	9.0	<b>F</b>
35	14.0	10.0	8.0	
30	13.0	9.0	7.0	
25	11.0	9.0	7.0	
20	10.0	8.0	6.0	<b>P</b>
15	9.0	6.5	5.0	
10	8.0	6.0	4.0	
5	6.0	4.0	1.0	
1	3.0	1.0	0.0	<b>VP</b>

Full body push-ups are generally used by law enforcement and public safety organizations. These norms are based on >1000 female U.S. Army soldiers who were tested in the 1990's by the U.S. Army.



## CARDIORESPIRATORY FITNESS TESTS

### Females

%	AGE 20-29				AGE 30-39				
	Balke Treadmill (time)	$\dot{V}O_2$ max (ml/kg/min.)	12 min. Run Distance (miles)	1.5 Mile Run (time)	Balke Treadmill (time)	$\dot{V}O_2$ max (ml/kg/min.)	12 min. Run Distance (miles)	1.5 Mile Run (time)	
99	27:19	54.4	1.83	9:29	26:00	52.5	1.77	9:51	
95	24:00	49.7	1.69	10:28	22:27	47.4	1.63	11:00	<b>S</b>
90	22:00	46.8	1.61	11:10	21:00	45.3	1.57	11:33	
85	21:00	45.3	1.57	11:33	20:00	43.9	1.53	11:58	
80	20:01	43.9	1.53	11:58	19:00	42.4	1.49	12:25	<b>E</b>
75	19:00	42.4	1.49	12:25	18:00	41.0	1.45	12:53	
70	18:01	41.0	1.45	12:53	17:01	39.6	1.41	13:23	
65	18:00	41.0	1.45	12:53	16:19	38.6	1.39	13:47	
60	17:00	39.5	1.41	13:24	15:49	37.8	1.37	14:04	<b>G</b>
55	16:15	38.5	1.38	13:49	15:18	37.1	1.34	14:23	
50	15:45	37.7	1.36	14:07	15:00	36.7	1.33	14:34	
45	15:01	36.7	1.33	14:34	14:00	35.2	1.29	15:14	
40	14:36	36.0	1.32	14:50	13:26	34.4	1.27	15:38	<b>F</b>
35	14:00	35.2	1.29	15:14	13:00	33.8	1.25	15:58	
30	13:08	34.0	1.26	15:52	12:09	32.5	1.22	16:38	
25	12:24	32.9	1.23	16:26	12:00	32.3	1.21	16:46	
20	12:00	32.3	1.21	16:46	11:00	30.9	1.17	17:38	<b>P</b>
15	11:00	30.9	1.17	17:49	10:01	29.5	1.13	18:37	
10	10:01	29.5	1.13	18:37	9:01	28.0	1.09	19:43	
5	8:21	27.1	1.07	20:31	7:35	25.9	1.30	21:31	
1	6:00	23.7	0.97	23:58	5:27	22.9	0.95	24:57	<b>VP</b>
	n=1,397				n=4,642				

Updated: 2013

Norms based on Cooper Clinic patients



## CARDIORESPIRATORY FITNESS TESTS

### Females

%	AGE 40-49				AGE 50-59			
	Balke Treadmill (time)	$\dot{V}O_2$ max (ml/kg/min.)	12 min. Run Distance (miles)	1.5 Mile Run (time)	Balke Treadmill (time)	$\dot{V}O_2$ max (ml/kg/min.)	12 min. Run Distance (miles)	1.5 Mile Run (time)
99	25:00	51.1	1.73	10:09	21:30	46.0	1.59	11:22
95	21:01	45.3	1.57	11:32	18:03	41.1	1.46	12:52 <b>S</b>
90	20:00	43.9	1.53	11:58	17:00	39.5	1.46	13:24
85	18:04	41.1	1.46	12:51	15:29	37.4	1.35	14:16
80	17:05	39.7	1.42	13:22	15:00	36.7	1.33	14:34 <b>E</b>
75	16:45	39.2	1.40	13:32	14:04	35.3	1.30	15:11
70	16:00	38.1	1.37	13:58	13:30	34.5	1.27	15:35
65	15:03	36.7	1.33	14:32	12:59	33.7	1.25	15:58
60	14:45	36.3	1.32	14:44	12:30	33.0	1.23	16:21 <b>G</b>
55	14:01	35.2	1.29	15:13	12:00	32.3	1.21	16:46
50	13:46	34.9	1.28	15:24	11:29	31.6	1.19	17:13
45	13:01	33.8	1.25	15:57	11:01	30.9	1.17	17:38
40	12:30	33.0	1.23	16:21	10:30	30.2	1.15	18:07 <b>F</b>
35	12:00	32.3	1.21	16:46	10:01	29.5	1.13	18:37
30	11:18	31.3	1.18	17:22	9:40	29.0	1.12	18:59
25	10:40	30.4	1.16	17:58	9:00	28.0	1.09	19:44
20	10:00	29.4	1.13	18:38	8:20	27.0	1.07	20:32 <b>P</b>
15	9:10	28.2	1.10	19:32	7:35	25.9	1.03	21:31
10	8:08	26.7	1.06	20:47	6:46	24.8	1.00	22:43
5	7:00	25.1	1.01	22:22	5:35	23.1	0.95	24:42
1	5:00	22.2	0.93	25:49	3:43	20.4	0.88	28:39 <b>VP</b>

n=6,709

n=4,539

Updated: 2013



## CARDIORESPIRATORY FITNESS TESTS

### Females

%	AGE 60-69				AGE 70-79				
	Balke Treadmill (time)	$\dot{V}O_2$ max (ml/kg/min.)	12 min. Run Distance (miles)	1.5 Mile Run (time)	Balke Treadmill (time)	$\dot{V}O_2$ max (ml/kg/min.)	12 min. Run Distance (miles)	1.5 Mile Run (time)	
99	20:00	43.9	1.53	11:58	20:00	43.9	1.53	11:58	
95	15:47	37.8	1.36	14:05	15:01	36.7	1.33	14:34	<b>S</b>
90	14:30	35.9	1.31	14:53	12:30	33.0	1.23	16:21	
85	13:31	34.5	1.27	15:35	11:43	31.9	1.20	17:00	
80	12:30	33.0	1.23	16:21	11:00	30.9	1.17	17:38	<b>E</b>
75	12:00	32.3	1.21	16:46	10:23	30.0	1.15	18:14	
70	11:19	31.3	1.18	17:21	10:01	29.5	1.13	18:37	
65	11:00	30.9	1.17	17:38	10:00	29.4	1.13	18:38	
60	10:25	30.0	1.15	18:12	9:05	28.1	1.10	19:38	<b>G</b>
55	10:00	29.4	1.13	18:38	8:59	28.0	1.09	19:44	
50	9:46	29.1	1.12	18:52	8:37	27.4	1.08	20:11	
45	9:16	28.4	1.10	19:25	8:01	26.6	1.05	20:56	
40	8:41	27.5	1.08	20:06	7:33	25.9	1.03	21:34	<b>F</b>
35	8:09	26.8	1.06	20:46	7:01	25.1	1.01	22:20	
30	7:43	26.1	1.04	21:20	6:49	24.8	1.00	22:38	
25	7:05	25.2	1.01	22:14	6:29	24.4	0.99	23:10	
20	6:45	24.7	1.00	22:44	6:07	23.8	0.98	23:46	<b>P</b>
15	6:15	24.0	0.98	23:32	5:15	22.6	0.94	25:20	
10	5:33	23.0	0.95	24:46	4:30	21.5	0.91	26:51	
5	4:45	21.9	0.92	26:19	3:15	19.7	0.86	29:51	
1	3:07	19.5	0.86	30:13	1:17	16.8	0.78	36:12	<b>VP</b>

n=1313

n=187

Updated: 2013



These fitness norms (Hoffman and Collingwood, 2005) are derived from male and female officers of various ages. The data comes from validation studies performed on 40 various federal, state, and municipal agencies. All of the data from the validation studies was *combined* to develop the chart below. The validation studies were performed by Tom Collingwood, Ph.D, not by the Cooper Institute.

Percentile	1.5	300	1 RM		PU	SU	VJ	AG	SR	% Fat
			Raw	Ratio						
99 <sup>th</sup>	9:28	38.8	355	1.75	77	60	28	15.2	26	6.2
90 <sup>th</sup>	11:31	48.3	273	1.38	56	49	23	16.2	23	12.7
80 <sup>th</sup>	12:32	52.8	243	1.23	47	44	21	16.7	21	15.7
70 <sup>th</sup>	13:14	55.6	220	1.12	40	40	20	17.0	20	17.3
60 <sup>th</sup>	13:58	58.9	202	1.02	35	37	19	17.3	19	19.0
50 <sup>th</sup>	14:40	62.2	182	.93	31	34	18	17.7	18	20.5
40 <sup>th</sup>	15:20	65.4	163	.86	29	31	16.5	18.0	17	22.0
30 <sup>th</sup>	15:55	70.1	153	.79	24	28	15	18.5	16	23.7
20 <sup>th</sup>	16:55	75.3	133	.71	19	25	14	19.1	15	25.3
10 <sup>th</sup>	17:00	82.9	104	.60	13	20	12	20.1	13.5	28.3
1 <sup>st</sup>	23:35	114.7	60	.40	2	6	7	24.3	9	34.8

n = approximately 4000

1.5 = 1.5 Mile Run Test

300 = 300 Meter Run Test

1 RM Raw = 1 RM Bench Press (pounds) Test

1 RM Ratio = 1 RM Free Weight Bench Press (pounds)/Body Weight

PU = 1 Minute Push-Up Test

SU = 1 Minute Sit-Up Test

VJ = Vertical Jump Test

AG = Illinois Agility Test

SR = Sit-and-Reach Test

% Fat = Percent Body Fat Test (skinfold method)



## References

The Cooper Institute. (2013). *Physical Fitness Assessments and Norms for Adults and Law Enforcement*. Dallas, TX.

Hoffman, R., & Collingwood, T. R. (2005). *Fit For Duty* (2<sup>nd</sup> ed.). Philadelphia, PA: Human Kinetics.