

BIODEX

Biodex Medical Systems, Inc.
20 Ramsay Road, Shirley, New York, 11967-4704
Tel: 631-924-9000, 800-224-6339

Date: December 21, 2004

From: Ed Behan

RE: Biodex Clinical Application Information Brief: Pediatric Normative data

Enclosed please find the percentile charts for pediatric knee extension flexion.

Biodex supported a study at Texas Children's Hospital to collect and develop normative data for quadriceps and hamstring isokinetic peak torque in children ages 6-13 years.

Over 3400 kids were testing using a protocol of 60, 120 and 180 degrees per second.

Mitzi Wiggin, PT spearheaded the project and I believe will be presenting the data at the 2005 CSM Meeting. They also plan on submitting it for publication.

In return for our support, Biodex was granted use of the data to include in our software and normative data charts. It's impressive work! The data is presented as a chart of percentiles. Example: If a 6-year old female recorded a peak torque of 15.5 ft-lb for dominant flexion (hamstrings), she would be in the 40 percentile.

PTDE = peak torque dominant extension

PTDF = peak torque dominant flexion

PTNDE = peak torque non-dominant extension

PTNDF = peak torque non-dominant flexion

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6 YEAR OLD MALES

QUADRICEPS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	124	124	124	124	124	124
	Missing	0	0	0	0	0	0
Percentiles	5	18.58	17.825	16.775	15.400	15.225	14.88
	10	20.05	20.000	18.200	16.700	16.400	15.90
	20	22.60	22.200	20.100	18.600	18.300	17.50
	30	24.30	23.500	21.350	20.000	19.800	18.65
	40	25.90	25.400	22.800	21.600	21.000	19.90
	50	27.85	26.400	24.000	22.800	22.100	21.30
	60	29.60	28.600	25.200	24.500	23.600	22.40
	70	32.60	29.900	27.250	26.300	24.800	23.70
	80	35.00	32.400	29.000	28.200	26.800	26.00
	90	41.10	38.150	34.600	33.750	30.600	29.50
	95	45.43	42.200	38.300	38.475	34.400	34.53

HAMSTRINGS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	124	124	124	124	124	124
	Missing	0	0	0	0	0	0
Percentiles	5	8.400	9.025	8.500	9.200	10.050	10.600
	10	9.600	10.100	10.250	9.850	11.350	11.750
	20	11.800	11.700	11.500	11.800	12.700	13.100
	30	13.300	12.700	12.550	12.650	13.800	14.100
	40	14.500	13.800	13.700	14.200	15.100	15.100
	50	16.000	14.850	15.400	15.150	17.000	16.050
	60	17.400	16.100	17.100	16.100	18.200	17.400
	70	19.200	17.500	18.300	17.800	19.900	18.500
	80	21.700	18.800	22.000	19.400	22.400	20.900
	90	25.250	23.600	25.050	25.300	25.700	25.300
	95	30.350	29.150	29.425	29.250	29.975	29.600

6 YEAR OLD FEMALES

QUADRICEPS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	145	145	145	145	145	145
	Missing	0	0	0	0	0	0
Percentiles	5	19.03	19.960	16.700	16.330	14.130	14.59
	10	20.66	21.080	18.260	17.960	15.780	16.34
	20	23.92	23.260	19.500	19.820	17.640	18.20
	30	26.00	25.400	20.900	21.400	19.500	19.26
	40	28.82	27.740	22.680	23.100	20.600	20.18
	50	30.40	29.300	24.100	24.000	21.800	21.60
	60	32.30	31.020	26.800	25.900	23.900	23.08
	70	34.62	32.320	28.800	27.400	25.160	24.84
	80	37.24	34.560	30.880	29.920	26.940	27.08
	90	40.74	40.020	33.200	33.720	30.140	29.30
	95	44.17	44.420	36.170	36.460	31.500	32.38

HAMSTRINGS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	145	145	145	145	145	145
	Missing	0	0	0	0	0	0
Percentiles	5	9.200	9.250	7.620	8.800	8.330	9.900
	10	10.660	10.320	8.900	10.180	10.520	11.100
	20	12.720	12.120	10.300	11.340	12.200	13.040
	30	14.400	13.200	12.980	12.900	14.000	14.200
	40	15.500	14.840	14.280	14.000	15.100	15.300
	50	16.500	16.100	15.100	15.200	15.700	16.100
	60	17.900	17.460	16.300	16.400	17.320	17.400
	70	19.540	18.840	17.600	17.420	18.640	18.460
	80	21.600	20.660	19.880	19.400	20.100	20.100
	90	24.920	23.540	24.180	23.780	23.260	22.920
	95	27.640	25.810	25.740	26.140	26.000	25.140

7 YEAR OLD MALES

QUADRICEPS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	167	167	167	167	167	167
	Missing	0	0	0	0	0	0
Percentiles	5	24.46	21.120	18.68	16.800	18.200	17.08
	10	26.40	25.180	21.68	20.380	20.120	20.04
	20	29.52	27.620	24.58	24.000	22.500	22.10
	30	31.60	29.340	27.30	25.840	24.500	24.18
	40	34.30	32.320	29.20	27.720	26.300	25.92
	50	36.10	34.600	30.80	30.000	27.900	27.40
	60	38.04	36.780	32.30	31.460	30.400	28.30
	70	41.64	39.500	35.22	33.440	31.560	30.72
	80	46.04	43.440	37.82	36.780	34.500	33.90
	90	51.16	46.960	43.10	42.200	39.900	38.10
	95	55.62	51.920	47.22	45.140	41.580	40.06

HAMSTRINGS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	167	167	167	167	167	167
	Missing	0	0	0	0	0	0
Percentiles	5	13.560	12.600	12.540	12.500	12.50	13.280
	10	14.760	13.600	13.280	13.680	14.10	14.900
	20	16.500	15.900	15.100	15.500	16.06	16.000
	30	17.880	17.400	16.700	16.440	17.44	17.540
	40	19.420	18.600	18.060	17.960	18.72	18.640
	50	20.700	19.900	18.700	19.000	19.80	20.200
	60	23.300	21.280	20.600	20.300	21.00	21.300
	70	25.060	24.080	22.520	21.760	23.50	23.020
	80	27.340	26.420	25.100	24.180	26.40	25.280
	90	30.400	29.620	28.540	27.900	28.92	28.340
	95	33.940	32.360	31.880	30.860	32.06	31.540

7 YEAR OLD FEMALES

QUADRICEPS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	191	191	191	191	191	191
	Missing	0	0	0	0	0	0
Percentiles	5	27.16	24.180	19.22	19.160	16.640	16.46
	10	29.20	26.440	20.90	22.120	19.140	19.16
	20	31.72	30.140	24.40	24.580	22.000	22.90
	30	33.60	32.300	26.70	26.700	23.500	24.40
	40	35.90	34.960	29.24	29.160	25.500	26.00
	50	38.10	37.300	30.80	31.200	27.300	27.80
	60	40.32	38.940	33.10	33.000	29.720	29.32
	70	42.68	41.540	35.18	35.800	31.140	31.72
	80	46.90	45.840	38.06	38.200	33.460	34.82
	90	52.98	50.920	42.24	42.780	37.160	36.98
	95	56.58	53.720	45.26	45.960	41.060	40.50

HAMSTRINGS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	191	191	191	191	191	191
	Missing	0	0	0	0	0	0
Percentiles	5	11.700	12.620	10.520	11.540	11.40	13.000
	10	13.360	13.800	11.900	13.000	13.60	14.400
	20	15.900	16.400	14.140	15.020	15.60	16.580
	30	17.860	17.860	16.060	17.320	17.00	17.900
	40	19.260	19.080	17.840	18.200	18.20	18.700
	50	20.300	20.300	18.700	19.400	19.50	20.300
	60	22.560	21.700	20.100	20.900	21.30	21.200
	70	25.400	23.140	22.680	22.800	22.98	22.900
	80	28.400	27.000	25.500	25.160	25.16	25.200
	90	32.340	30.720	29.600	28.700	28.94	28.200
	95	35.560	33.540	32.740	30.780	32.30	30.980

8 YEAR OLD MALES

QUADRICEPS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	208	208	208	208	208	208
	Missing	0	0	0	0	0	0
Percentiles	5	31.83	30.55	26.040	25.690	21.93	22.635
	10	33.99	32.39	28.560	26.800	25.00	24.980
	20	37.76	34.30	31.460	29.760	27.10	27.260
	30	41.34	37.54	33.170	31.840	30.10	28.900
	40	43.46	40.30	35.800	34.000	32.30	31.820
	50	46.20	42.35	37.350	37.250	33.90	33.800
	60	48.40	44.82	39.980	39.780	36.06	35.500
	70	52.90	48.00	42.700	42.020	38.60	38.260
	80	56.10	53.60	46.420	46.020	42.44	41.900
	90	62.83	58.90	51.410	51.350	47.51	45.620
	95	67.44	62.80	55.900	57.200	49.86	50.465

HAMSTRINGS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	208	208	208	208	208	208
	Missing	0	0	0	0	0	0
Percentiles	5	15.735	14.145	13.700	13.800	14.99	15.615
	10	17.780	17.090	15.480	16.680	17.00	17.900
	20	20.180	19.400	18.320	18.400	19.50	20.280
	30	22.170	22.100	20.700	20.840	21.77	21.400
	40	25.060	23.100	22.500	21.700	23.02	22.800
	50	28.500	25.500	25.300	23.300	24.90	24.450
	60	30.200	26.740	27.600	26.200	27.34	26.700
	70	33.010	30.220	30.590	28.158	30.20	29.090
	80	35.820	34.040	33.120	31.600	33.40	32.100
	90	43.310	39.120	39.400	35.710	38.92	35.850
	95	48.010	45.025	43.885	40.340	42.95	40.430

8 YEAR OLD FEMALES

QUADRICEPS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	242	242	242	242	242	242
	Missing	0	0	0	0	0	0
Percentiles	5	31.70	30.00	24.400	24.100	21.63	22.590
	10	33.93	33.40	26.300	27.030	23.10	24.000
	20	39.26	37.08	31.200	30.860	26.64	27.100
	30	42.58	40.10	33.990	34.200	29.60	29.690
	40	44.76	42.62	36.100	35.800	31.70	31.500
	50	47.80	45.75	38.000	37.800	33.20	33.550
	60	50.60	48.08	40.260	39.500	35.26	35.300
	70	53.60	51.10	42.610	42.300	37.42	37.000
	80	57.44	54.80	44.900	45.340	40.74	40.820
	90	62.40	61.61	50.220	50.110	45.47	45.270
	95	69.96	66.24	55.685	55.060	48.79	48.755

HAMSTRINGS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	242	242	242	242	242	242
	Missing	0	0	0	0	0	0
Percentiles	5	15.115	15.245	14.000	13.630	15.20	14.800
	10	17.100	17.000	16.160	15.300	16.86	16.000
	20	19.760	19.400	17.720	17.400	18.52	18.600
	30	21.300	20.300	19.090	18.800	20.10	20.290
	40	23.500	22.020	20.220	20.340	21.60	21.320
	50	25.150	24.000	22.100	22.150	22.80	23.000
	60	27.100	25.880	23.980	24.300	23.98	24.300
	70	29.400	28.300	26.700	26.020	26.00	26.700
	80	32.520	31.300	29.200	29.420	30.04	29.480
	90	38.500	38.190	36.810	37.370	36.90	36.240
	95	42.800	45.600	42.255	44.155	41.14	40.970

9 YEAR OLD MALES

QUADRICEPS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	223	223	223	222	223	223
	Missing	0	0	0	1	0	0
Percentiles	5	34.70	31.94	25.980	26.80	23.620	23.220
	10	39.42	34.70	31.580	30.12	28.180	27.500
	20	43.20	40.40	36.140	34.48	32.080	31.100
	30	48.10	45.30	40.540	37.39	36.120	33.900
	40	51.76	48.58	43.460	41.26	38.460	37.700
	50	55.30	52.30	45.600	45.00	40.400	39.600
	60	58.70	54.72	48.500	47.10	43.400	41.940
	70	62.48	57.80	52.060	50.40	46.000	44.580
	80	68.50	62.58	56.460	53.20	49.800	47.920
	90	79.38	71.80	64.100	59.61	55.600	55.100
	95	85.20	78.40	69.220	64.00	61.640	58.560

HAMSTRINGS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	223	223	223	223	223	223
	Missing	0	0	0	0	0	0
Percentiles	5	17.98	17.080	15.980	15.940	16.760	17.180
	10	20.14	19.000	18.640	17.760	19.300	19.400
	20	23.10	22.040	21.960	21.360	22.200	22.180
	30	26.70	25.200	24.400	23.740	24.700	24.400
	40	30.06	27.500	26.520	25.800	27.300	26.600
	50	32.10	30.000	29.000	27.700	29.300	27.900
	60	34.00	31.380	30.480	29.800	31.140	30.480
	70	36.98	35.080	34.000	32.380	33.760	33.440
	80	41.98	38.960	37.780	36.700	37.300	36.300
	90	49.64	47.200	45.780	42.080	44.380	43.020
	95	55.58	51.980	51.740	47.280	49.960	48.000

9 YEAR OLD FEMALES

QUADRICEPS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	285	285	285	285	285	285
	Missing	0	0	0	0	0	0
Percentiles	5	36.53	33.15	28.110	27.42	23.500	22.600
	10	39.68	38.52	31.140	29.72	26.520	25.720
	20	46.12	43.00	35.960	35.74	30.640	29.760
	30	49.94	47.90	39.580	39.30	34.960	35.380
	40	54.56	51.62	43.400	42.20	38.140	37.300
	50	58.00	54.80	46.500	45.00	40.400	39.200
	60	61.72	58.70	49.500	49.10	42.880	42.520
	70	65.34	63.66	52.300	52.22	46.100	45.620
	80	74.00	67.48	56.640	56.00	50.760	49.480
	90	82.00	77.86	67.120	64.10	56.400	57.000
	95	90.70	85.08	73.410	70.57	63.220	61.130

HAMSTRINGS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	284	285	285	285	285	285
	Missing	1	0	0	0	0	0
Percentiles	5	18.05	17.500	15.290	15.700	16.030	16.430
	10	20.75	18.880	18.000	17.800	18.760	18.400
	20	23.60	22.500	21.320	20.920	21.840	21.720
	30	26.10	24.800	23.500	22.900	24.100	23.580
	40	28.60	26.340	25.200	25.140	26.080	25.800
	50	30.70	29.000	27.400	26.600	28.200	27.400
	60	33.60	31.960	29.300	28.780	30.200	28.960
	70	37.25	35.900	31.980	31.300	32.720	30.900
	80	41.00	39.500	36.680	35.640	35.800	35.400
	90	47.40	46.200	43.160	42.360	41.720	41.900
	95	52.30	50.060	47.910	47.780	48.460	46.640

10 YEAR OLD MALES

QUADRICEPS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	233	233	233	233	233	233
	Missing	0	0	0	0	0	0
Percentiles	5	39.67	38.410	33.330	32.500	30.140	27.440
	10	45.40	44.180	37.820	35.380	33.160	33.500
	20	53.24	49.360	43.260	41.480	37.800	37.400
	30	57.66	54.200	46.600	45.040	40.320	40.700
	40	60.70	57.640	49.400	48.340	44.160	43.300
	50	65.90	61.300	54.100	51.900	46.600	45.600
	60	70.20	65.040	56.400	54.900	50.160	48.700
	70	74.78	68.060	59.800	59.300	53.960	52.380
	80	82.70	73.680	65.100	63.760	57.040	56.800
	90	91.94	82.620	72.280	69.260	65.740	62.560
	95	99.08	94.520	79.750	74.680	71.750	68.010

HAMSTRINGS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	233	233	233	233	233	233
	Missing	0	0	0	0	0	0
Percentiles	5	22.160	21.470	20.300	19.160	21.200	19.240
	10	25.720	23.780	22.800	22.840	23.300	23.140
	20	29.600	27.480	26.680	25.900	27.100	26.280
	30	33.120	29.720	28.600	27.900	28.920	28.220
	40	35.700	32.700	30.500	30.480	31.480	30.320
	50	39.600	35.800	34.300	33.200	34.000	33.400
	60	43.260	40.160	38.840	36.540	39.200	37.460
	70	47.280	45.160	42.160	41.040	43.340	40.960
	80	53.480	49.820	48.320	45.540	46.400	44.340
	90	59.200	55.780	53.520	51.700	53.520	50.520
	95	70.610	66.740	63.030	64.730	62.150	58.390

10 YEAR OLD FEMALES

QUADRICEPS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	257	257	257	257	257	257
	Missing	0	0	0	0	0	0
Percentiles	5	42.61	38.770	30.870	33.000	27.340	26.180
	10	46.36	43.900	34.600	35.340	30.400	30.080
	20	52.10	49.480	39.300	39.660	34.800	34.600
	30	57.84	53.680	44.180	44.980	39.100	38.200
	40	63.20	59.560	48.500	48.320	43.180	41.600
	50	67.90	63.900	51.800	52.500	46.600	45.300
	60	71.78	68.460	57.180	55.900	49.580	49.080
	70	78.20	72.760	61.240	60.420	53.760	52.960
	80	84.18	78.360	68.420	67.040	60.360	59.580
	90	96.10	91.080	78.020	78.500	68.820	69.940
	95	104.33	100.120	87.370	89.300	77.310	77.430

HAMSTRINGS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	257	257	257	257	257	257
	Missing	0	0	0	0	0	0
Percentiles	5	19.300	18.000	16.390	16.950	16.760	18.000
	10	22.000	21.180	19.640	19.740	20.100	19.980
	20	26.700	25.160	22.200	23.020	23.380	23.480
	30	29.480	28.240	25.840	26.300	26.240	25.540
	40	33.100	31.500	29.040	28.120	29.220	28.300
	50	36.300	33.600	31.700	30.800	31.700	30.000
	60	39.700	37.000	34.300	33.600	34.560	32.960
	70	43.180	39.560	36.900	36.540	37.400	36.160
	80	49.412	43.340	43.400	41.680	42.800	40.340
	90	55.540	51.900	49.680	47.700	49.520	46.240
	95	61.750	56.310	54.420	53.800	54.600	50.020

11 YEAR OLD MALES

QUADRICEPS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	194	194	194	194	194	194
	Missing	0	0	0	0	0	0
Percentiles	5	50.125	45.425	39.425	37.125	32.475	33.325
	10	54.250	49.200	44.100	41.450	37.500	37.950
	20	60.900	54.500	48.300	46.500	42.300	41.400
	30	67.700	60.300	53.900	50.700	46.150	45.400
	40	73.600	68.100	58.700	56.100	50.600	48.400
	50	81.100	73.950	63.350	61.350	55.900	52.850
	60	86.100	80.000	69.200	65.200	59.900	57.900
	70	92.000	86.200	73.200	70.850	64.100	61.500
	80	101.200	93.200	77.000	75.000	69.600	66.900
	90	113.900	102.300	88.400	81.700	81.500	74.300
	95	119.875	112.075	98.125	92.950	86.075	81.100

HAMSTRINGS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	194	194	194	194	194	194
	Missing	0	0	0	0	0	0
Percentiles	5	28.325	25.225	26.500	22.850	26.700	25.500
	10	33.250	29.250	29.650	28.200	29.800	29.150
	20	38.600	35.000	37.400	34.600	35.100	33.600
	30	43.850	39.200	39.550	38.650	39.950	37.500
	40	48.500	43.800	44.300	42.000	43.700	40.300
	50	52.550	50.000	47.950	45.350	47.400	44.900
	60	57.600	54.400	52.600	51.400	51.300	48.400
	70	65.300	62.100	58.000	57.300	56.500	53.900
	80	74.900	68.900	65.800	65.100	63.300	60.200
	90	87.650	78.700	77.600	73.050	73.350	68.500
	95	93.375	82.675	84.800	82.250	79.750	75.200

11 YEAR OLD FEMALES

QUADRICEPS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	373	373	373	373	373	373
	Missing	0	0	0	0	0	0
Percentiles	5	51.010	48.520	39.410	39.410	34.540	33.780
	10	57.840	53.020	44.900	42.640	37.740	36.100
	20	64.500	60.620	49.960	48.380	42.200	39.900
	30	70.240	65.020	53.620	51.800	44.360	43.860
	40	75.060	69.080	56.220	55.500	47.260	47.420
	50	79.600	73.300	59.100	59.300	50.400	50.700
	60	84.380	78.540	63.240	62.400	54.000	53.520
	70	91.260	84.180	68.600	67.380	58.640	57.580
	80	98.040	91.800	74.920	72.880	64.000	62.440
	90	108.440	101.840	83.140	82.520	69.520	70.580
	95	117.990	109.020	91.700	88.090	76.900	74.720

HAMSTRINGS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	373	373	373	373	373	373
	Missing	0	0	0	0	0	0
Percentiles	5	27.210	28.240	24.440	24.940	22.800	24.470
	10	31.240	31.020	28.240	28.100	28.020	28.020
	20	38.080	35.660	33.600	32.300	33.000	31.860
	30	43.820	41.200	38.240	37.400	37.300	35.220
	40	48.920	45.520	42.360	41.560	41.500	38.720
	50	53.800	49.600	46.900	44.700	44.300	41.500
	60	58.780	54.040	50.700	48.180	48.440	44.780
	70	63.500	58.640	54.100	51.900	50.400	48.000
	80	69.320	64.100	59.080	56.400	56.000	51.820
	90	76.820	70.860	66.820	63.540	62.060	60.420
	95	82.060	78.290	73.430	71.130	69.630	64.820

12 YEAR OLD MALES

QUADRICEPS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	197	197	197	197	197	197
	Missing	0	0	0	0	0	0
Percentiles	5	59.790	52.690	45.69	43.820	39.030	38.180
	10	64.000	59.060	51.38	48.620	42.700	41.200
	20	71.380	66.500	57.32	55.620	48.340	48.220
	30	79.200	74.940	61.52	61.340	53.080	53.920
	40	83.900	80.600	65.64	66.300	58.520	57.420
	50	92.100	85.800	70.60	70.000	62.200	61.300
	60	100.140	92.940	76.86	74.160	65.980	64.780
	70	107.900	99.740	82.76	80.920	70.800	70.400
	80	117.640	108.680	91.38	87.940	77.520	77.840
	90	134.540	116.100	102.90	100.240	86.900	85.840
	95	147.800	135.890	111.19	111.300	94.380	97.060

HAMSTRINGS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	197	197	197	197	197	197
	Missing	0	0	0	0	0	0
Percentiles	5	41.950	40.200	39.920	35.700	39.080	36.900
	10	48.260	44.460	44.280	40.020	43.080	39.680
	20	55.880	51.340	49.960	47.080	49.060	44.100
	30	61.000	58.000	53.920	52.900	52.300	49.920
	40	65.520	62.000	59.160	58.000	56.500	55.200
	50	70.200	66.300	63.600	61.300	60.700	57.800
	60	76.980	71.200	69.360	65.180	65.600	61.400
	70	83.700	76.740	73.380	69.560	69.980	65.800
	80	89.800	82.980	79.300	76.440	76.540	70.500
	90	97.600	91.240	89.420	85.280	84.240	79.620
	95	111.380	100.230	99.030	92.610	91.670	85.780

12 YEAR OLD FEMALES

QUADRICEPS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	340	340	340	340	340	340
	Missing	0	0	0	0	0	0
Percentiles	5	57.105	54.930	40.53	44.200	36.700	36.905
	10	64.530	62.200	49.41	47.940	41.240	40.000
	20	73.040	67.860	54.52	53.620	46.420	45.440
	30	79.760	74.120	59.16	59.030	49.290	49.400
	40	84.540	79.300	62.04	63.140	52.240	52.100
	50	90.950	85.150	65.70	65.850	56.050	55.800
	60	96.920	89.400	70.90	70.500	60.100	59.900
	70	102.600	95.500	76.27	74.140	63.570	63.600
	80	113.120	105.020	81.92	79.760	69.400	67.360
	90	123.270	113.690	91.40	90.270	78.150	75.800
	95	134.095	122.985	99.88	98.390	83.285	83.385

HAMSTRINGS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	340	340	340	340	340	340
	Missing	0	0	0	0	0	0
Percentiles	5	42.040	39.605	37.010	35.300	33.000	31.125
	10	46.900	43.030	40.520	39.510	37.650	35.810
	20	54.860	51.140	47.600	45.000	44.220	41.440
	30	59.900	55.360	51.030	47.500	48.000	44.300
	40	62.680	58.700	54.000	51.400	50.080	47.200
	50	66.150	61.600	57.500	55.250	53.400	50.500
	60	70.600	65.440	60.200	57.960	56.060	53.000
	70	74.140	69.000	64.240	61.670	59.210	56.370
	80	80.380	76.660	67.800	66.280	63.580	59.780
	90	88.670	83.100	75.300	72.080	70.090	65.590
	95	95.690	89.880	80.495	80.100	75.080	74.635

13 YEAR OLD MALES

QUADRICEPS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	208	208	208	208	208	208
	Missing	0	0	0	0	0	0
Percentiles	5	68.74	60.52	48.80	51.46	43.59	42.70
	10	75.42	68.38	54.09	55.59	48.05	44.70
	20	83.82	76.94	62.28	61.56	52.10	52.98
	30	92.65	83.53	68.18	65.78	56.85	56.04
	40	98.66	91.30	72.24	71.20	62.56	61.48
	50	104.20	98.45	78.30	75.70	66.45	66.20
	60	112.50	105.32	83.84	80.74	70.98	69.20
	70	122.63	113.99	91.68	87.36	77.02	75.09
	80	137.26	124.58	100.52	95.54	86.50	84.20
	90	149.20	140.78	114.31	111.32	97.14	93.40
	95	161.01	155.57	121.73	121.99	105.25	103.56

HAMSTRINGS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	208	208	208	208	208	208
	Missing	0	0	0	0	0	0
Percentiles	5	45.23	42.38	39.22	38.17	37.78	34.53
	10	56.55	52.80	47.10	45.69	45.17	43.36
	20	63.30	58.78	54.48	53.56	51.66	49.18
	30	67.89	64.19	59.00	57.97	56.25	53.77
	40	75.08	69.48	63.78	62.34	59.46	57.20
	50	80.80	73.30	69.75	66.00	64.35	61.35
	60	86.54	77.50	75.04	70.16	69.48	65.44
	70	94.26	85.46	79.76	76.36	73.79	71.08
	80	102.86	93.70	86.02	83.80	80.78	78.08
	90	111.72	105.50	97.45	91.44	92.40	86.12
	95	120.67	114.62	105.00	106.80	102.86	100.37

13 YEAR OLD FEMALES

QUADRICEPS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	197	197	197	197	197	197
	Missing	1	1	1	1	1	1
Percentiles	5	67.34	65.56	51.40	49.54	41.98	39.68
	10	77.06	71.86	55.98	56.40	47.06	47.40
	20	84.96	83.36	62.98	62.28	54.16	52.66
	30	91.86	86.84	69.06	68.64	58.34	55.98
	40	98.62	93.00	73.52	72.84	62.02	61.46
	50	104.50	99.50	78.90	77.30	65.40	65.60
	60	110.80	105.18	84.90	80.70	71.06	69.38
	70	118.44	111.34	89.72	87.66	76.42	74.32
	80	129.44	120.34	95.18	94.00	81.10	82.10
	90	148.36	140.30	111.96	107.16	96.80	91.86
	95	167.83	156.41	129.41	117.48	101.21	105.26

HAMSTRINGS

		PTDE60	PTNDE60	PTDE120	PTNDE120	PTDE180	PTNDE180
N	Valid	197	197	197	197	197	197
	Missing	1	1	1	1	1	1
Percentiles	5	47.55	42.34	42.36	36.70	38.00	34.88
	10	51.04	48.24	47.54	42.40	43.40	39.98
	20	59.70	56.84	51.90	51.36	49.16	45.88
	30	66.00	61.68	57.32	54.10	52.38	50.24
	40	71.50	67.02	60.52	58.30	57.82	52.60
	50	76.10	70.40	66.40	62.80	60.70	55.90
	60	80.72	74.60	69.92	67.26	63.86	60.26
	70	87.08	79.06	74.70	71.42	70.40	64.98
	80	95.94	88.10	81.94	80.88	76.58	74.76
	90	108.24	104.00	95.86	91.70	88.84	82.20
	95	119.32	113.87	104.50	98.63	101.30	88.86