

DEXA
EXAMPLE
BASELINE
REPORT
(FIRST TEST)

Merivale Medical Imaging

1370 Clyde Ave.
 Nepean, ON, K2G 3H8
 Phone: 613-727-1072

Name:
 Patient ID:
 Sex:

Birth Date:
 Measured:

Height: 173.2 cm
 Weight: 78.3 kg

Bone



Tissue Gradient



Tissue



Image not for diagnosis

Image not for diagnosis

Color Coding



Measured Date:	
Total Mass:	77.6 kg
Fat Mass:	15,371 g
Lean Mass:	59,616 g
Visceral Adipose Tissue:	184 g
%Fat / Percentile:	20.5 / 33
Android / Gynoid Ratio:	1.27
BMD/Age Matched Percentile:	1.139 / 27

Region	Tissue (% fat)	Total Mass (kg)	Fat (g)	Lean (g)	BMC (g)
Arms	16.3	10.7	1,670	8,600	414
Legs	19.1	25.0	4,570	19,338	1,067
Trunk	22.5	37.6	8,297	28,584	752
Android	24.8	5.3	1,301	3,943	30
Gynoid	19.5	10.5	2,004	8,262	247
Total	20.5	77.6	15,371	59,616	2,641

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LEAN

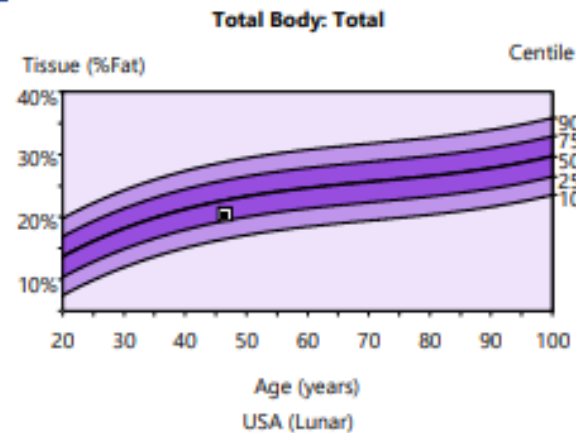


Lean mass includes all parts of the body [organs, muscle, and fluids] but excludes body fat.

The higher the Tissue %Lean, the more muscular the body.

Total Mass:	77.6 kg
Lean Mass:	59,616 g
Tissue %Lean:	76.8 %

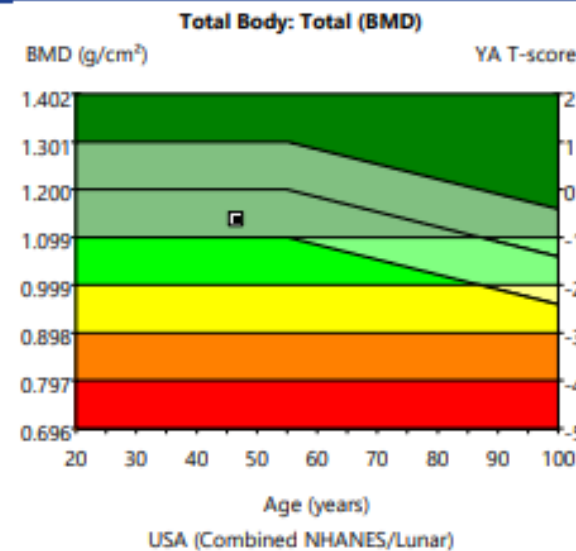
FAT



Fat Mass:	15,371 g
Tissue (%Fat)	20.5 %

The composition reference graph shows your Total Body Tissue %Fat result [(fat / lean + fat) x 100] compared to a reference population. This comparison is very similar to how babies are measured and compared to reference data for height and weight. The bold black line on the graph represents the median result for the reference population. The square on the graph represents your result and you can see how you compare to this reference population.

BONE



Age	BMD (g/cm ²)	T-score	Z-score	Centile
45	1.139	-0.6	-0.6	27

A bone densitometry test helps your physician to diagnose osteoporosis. The test compares your Bone Mineral Density (BMD) to that of a "young adult" at peak bone strength, displayed as your T-score. It also compares your results to people of your same age, called "age-matched" displayed as your Z-score. This information, along with other factors, helps physicians assess your risk of osteoporotic fracture.

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ANDROID / GYNOID (waist / hip)



While Total Body %Fat will tell you more about your overall fitness than your weight alone, regional fat distribution tells you where the fat is located.

Region	Tissue %Fat
Android:	24.8 %
Gynoid:	19.5 %
A/G Ratio:	1.27

Android (waist) fat is often associated with apple-shaped body types.

Gynoid (hip) fat is often associated with pear-shaped body types.

VISCERAL ADIPOSE TISSUE (VAT) & SUBCUTANEOUS ADIPOSE TISSUE (SAT)



Adipose Tissue
1 Visceral
2 Subcutaneous

CoreScan estimates the VAT (Visceral Adipose Tissue) and SAT (Subcutaneous Adipose Tissue) content within the android region, VAT is a specific type of fat that is associated with several types of metabolic diseases such as obesity, metabolic syndrome, and type 2 diabetes.

VAT Mass	184 g
VAT Area	22 cm ²
VAT Volume	195 cm ³
SAT Mass	1,214 g
SAT Area	147 cm ²
SAT Volume	1,287 cm ³

CoreScan results have been validated for adults between ages 18-90, and with a BMI in the range of 18.5-40.

Fat Mass to Fat Volume Conversion

0.94 g of fat is equal to 1 cm³.

COMPOSITION ASSESSMENT



Understanding your body composition is valuable because a person's level of body fat is directly correlated with healthy outcomes. Obesity-related diseases include heart disease, type 2 diabetes, hypertension, and stroke. Working toward weight loss if you are overweight or obese can have a profound positive effect on your health.

Weight loss alone won't necessarily lead to huge decreases in your body fat percentage since weight loss without exercise will lead to decreases in lean mass as well. To decrease your body fat percentage you have to sustain a healthy diet, maintain cardiovascular exercise regimens, and, include resistance training to build up your lean mass, otherwise approximately 25% of every pound you lose will come from lean, calorie-burning muscle.

An ideal body fat percentage is different for men compared to women. Women require a higher body fat percentage in order to maintain menstruation and the ability to have children.

General Body-Fat Percentage Categories*

Classification	Women (%fat)	Men (%fat)
Essential Fat	10 - 13%	2 - 5%
Athletes	14 - 20%	6 - 13%
Fitness	21 - 24%	14 - 17%
Average	25 - 31%	18 - 24%
Obese	≥ 32%	≥ 25%

Your total body has

19.8

percent body fat.

* American Council on Exercise (2003) ACE Personal Trainer Manual, 3rd Ed., Ch. 6, Pg. 188

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RESTING METABOLIC RATE (RMR)



Resting Metabolic Rate (RMR) is synonymous with Resting Energy Expenditure (REE) and is an estimate of how many calories you would burn if you were to do nothing but rest. It represents the minimum amount of energy needed to maintain body temperature, heartbeat, and respiratory rate.

YOUR RMR: 1,639 cal/day

RMR (Resting Metabolic Rate) based on Mifflin-St Jeor equation.
RMR = 19.7 x FFM(fat free mass) + 413
Mifflin MD, St Jeor ST, Hill LA, Scott BJ, Daugherty SA, Koh YO. A new predictive equation for resting energy expenditure in healthy individuals., Am J Clin Nutr., 1990 Feb;51(2):241-7. PMID: 2305711

DAILY CALORIC NEED* CALCULATOR

Definition of Activity Levels

Sedentary	little or no exercise
Light	light exercise/sports 1-3 days per week
Moderate	moderate exercise or sport 3-5 days per week
Very	hard exercise or sport 6-7 days per week
Extreme	very hard exercise/sports and physical job

Calorie Converter

1 gram of protein =	4 calories
1 gram of carbohydrates =	4 calories
1 gram of fat =	9 calories

* This is the caloric requirement of your body based on your current fat free mass (lean tissue and bone mineral content).

Activity Level	Factor	LOSE	MAINTAIN	GAIN
		80%	100%	120%
Sedentary	1.2	1573	1967	2360
Light	1.375	1803	2254	2704
Moderate	1.55	2032	2540	3049
Very	1.725	2262	2827	3393
Extreme	1.9	2491	3114	3737

Activity Level	Factor	Daily Calories	Percentage of calories:		
			20%	50%	30%
Sedentary	1.2	1967	98.3	245.9	65.6
Light	1.375	2254	112.7	281.7	75.1
Moderate	1.55	2540	127.0	317.6	84.7
Very	1.725	2827	141.4	353.4	94.2
Extreme	1.9	3114	155.7	389.3	103.8

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NUTRITIONAL RECOMMENDATIONS



Key Recommendations for healthy eating patterns should be applied in their entirety to reflect an overall healthy eating pattern.

- Consume a healthy eating pattern that accounts for all food and beverages within an appropriate calorie level.
A healthy eating pattern includes:
 - A variety of vegetables from all of the subgroups— dark green, red and orange, legumes (beans and peas), starchy, and other
 - Fruits, especially whole fruits
 - Grains, at least half of which are whole grains
 - Fat-free or low-fat dairy, including milk, yogurt, cheese, and/or fortified soy beverages
 - A variety of protein foods, including seafood, lean meats and poultry, eggs, legumes (beans and peas), and nuts, seeds, and soy products.
 - Oils
- *A healthy eating pattern limits:*
 - Saturated and *trans* fats, added sugars, and sodium.

Key Recommendations that are quantitative are provided for several components of the diet that should be limited. These components are of particular public health concern, and the specified limits can help individuals achieve healthy eating patterns within calorie limits:

- Consume less than 10% of calories per day from added sugars
- Consume less than 10% of calories per day from saturated fats
- Consume less than 2,300 milligrams (mg) per day of sodium
- If alcohol is consumed, it should be consumed in moderation – up to one drink per day for women and up to two drinks per day for men – and only by adults of legal drinking age.

Source: United States Department of Agriculture 2015-2020 Dietary Guidelines for Americans - Key Recommendations

RELATIVE SKELETAL MUSCLE INDEX (RSMI)



RSMI represents the relative amount of muscle in the arms and legs. The DXA result is a screening tool and can help physicians with determining your risk for sarcopenia.

Sarcopenia is a disease associated with the aging process. Loss of muscle mass and strength affects balance, gait, and the ability to perform daily living tasks.

YOUR RSMI: 9.31 kg/m²

Sarcopenia Classification	RSMI Result
Males	< 7.26
Females	< 5.45

RSMI (Relative Skeletal Muscle Index) based on Baumgartner equation.
 $RSMI = (\text{lean mass of arms}[\text{kg}] + \text{lean mass of legs}[\text{kg}]) / (\text{height}[\text{m}]^2)$
Baumgartner RN, Koehler KM, Gallagher D, Romero L, Heymsfield SB, Ross RR, Garry PJ, Lindeman RD (1998) Epidemiology of sarcopenia among the elderly in New Mexico. *Am J Epidemiol* 147(8):755-763.

ADDITIONAL RECOMMENDATIONS

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Lean Mass Balance



Lean mass balance is a comparison of your body's right to left lean mass symmetry. A lean mass difference close to zero indicates a balance of muscle. An injury, non-symmetrical training, or a health condition may cause disproportionate lean mass differences, but only your physician can determine if a health condition is the related cause.

Arms Composition	Both Arms	Right Arm	Left Arm	Total Arm Difference
Lean Mass	8,600 g	4,257 g	4,342 g	-85 g
Fat Mass	1,670 g	795 g	875 g	-80 g
Bone Mineral Content	414 g	205 g	209 g	-4 g
Total Mass	10.7 kg	5.3 kg	5.4 kg	-0.2 kg

Legs Composition	Both Legs	Right Leg	Left Leg	Total Leg Difference
Lean Mass	19,338 g	9,721 g	9,618 g	103 g
Fat Mass	4,570 g	2,234 g	2,336 g	-102 g
Bone Mineral Content	1,067 g	532 g	535 g	-3 g
Total Mass	25.0 kg	12.5 kg	12.5 kg	0.0 kg

Trunk Composition	Both Trunks	Right Trunk	Left Trunk	Total Trunk Difference
Lean Mass	28,584 g	14,001 g	14,583 g	-582 g
Fat Mass	8,297 g	4,403 g	3,893 g	510 g
Bone Mineral Content	752 g	395 g	357 g	38 g
Total Mass	37.6 kg	18.8 kg	18.8 kg	0.0 kg

Total Composition	Total Body	Right Total	Left Total	Total Body Difference
Lean Mass	59,616 g	29,765 g	29,851 g	-86 g
Fat Mass	15,371 g	7,913 g	7,457 g	456 g
Bone Mineral Content	2,641 g	1,361 g	1,280 g	81 g
Total Mass	77.6 kg	39.0 kg	38.6 kg	0.5 kg

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DEFINITIONS

DEXA - DUAL ENERGY X-RAY ABSORPTIOMETRY: The *method* used during a scan is called Dual Energy X-ray Absorptiometry, since two specific energies are required to measure bone and soft tissue.

DXA - DUAL X-RAY ABSORPTIOMETER: The *system* used during a scan is called a Dual X-ray Absorptiometer, and is commonly called a bone densitometer.

THREE COMPARTMENT MODEL: A DXA scan will differentiate the body into three distinct types of tissue: 1) lean mass, 2) fat mass and 3) bone mineral content. Other methods of measuring body composition such as skin-fold measurements, bioelectric impedance analysis (BIA) and hydrostatic weighing can only determine body composition in a two compartment model of simply fat mass and fat free mass.

1- LEAN MASS: This is the sum of all the muscle and soft organ tissue (internal organs, ligaments, connective tissue, etc.)

2- FAT MASS: This is the sum of all the fatty tissue and includes the fat found within the organs of the body as well as the subcutaneous fat found under the skin.

3- BMC: This stands for Bone Mineral Content and is the measurement of the dry bone mass.

FFM - FAT FREE MASS: The Fat Free Mass result is calculated by summing the *lean mass* and the *bone mineral content*.

TISSUE MASS: The tissue result is calculated by summing the *lean mass* and the *fat mass*.

TOTAL MASS: The total mass is calculated by summing all three measurements of the *lean mass*, *fat mass* and *bone mineral content*.

TISSUE PERCENT FAT: This value is used to determine how much fat is in the tissue. This is calculated by dividing the fat mass by the tissue mass ($\text{Tissue \% fat} = \text{Fat Mass} / \text{Tissue Mass} \times 100$).

REGION PERCENT FAT: This value is used to determine how much fat is in the in the whole region. This is calculated by dividing the fat mass by the Total Mass [$\text{Region \% fat} = \text{Fat Mass} / (\text{Tissue Mass} + \text{BMC}) \times 100$].

REGIONS: The DXA scanner will calculate the lean, fat and bone mineral content of the total body as well as in the various sub-regions of interest for the *left/right arm*, *left/right leg*, *left/right trunk*, *android*, *gynoid* and *head*.

TRUNK: The trunk (or torso) is an anatomical term for the central part of the body from which extend the neck, arms and legs. The trunk includes the thorax and the abdomen.

ANDROID: The android region is located immediately above the pelvis and extends upwards to include 20% of the distance from the top of the pelvis to the base of the chin. Android fat is often associated with apple-shaped body types.

GYNOID: The gynoid region is placed with its upper boundary positioned below the top of the pelvis at a distance equal to 1.5 times the height of the android region. The total height of the gynoid is two times the height of the android region. Gynoid (hip) fat is often associated with pear-shaped body types.

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VAT - VISCERAL ADIPOSE TISSUE: The DXA software estimates the Visceral Adipose Tissue (VAT) content within the android region. The content that is estimated is the VAT Mass and VAT Volume. Some of the diseases/conditions for which VAT estimation can be useful include hypertension, impaired fasting glucose, impaired glucose tolerance, diabetes mellitus, dyslipidemia and metabolic syndrome.

MIRROR IMAGE: The MirrorImage function can be used to estimate the total body composition and bone mineral content when regions of the body are outside of the scan window by using scanned data from the corresponding region(s) on the opposite half of the body. Estimated results will be displayed with "(e)" to indicate an estimate was used.

ARTIFACT: Artifacts seen in DXA x-ray images may be due to patient factors (such as movement during acquisition) or the presence of external or internal non-anatomical objects (such as metal).

RMR - RESTING METABOLIC RATE: Resting Metabolic Rate (RMR) is synonymous with Resting Energy Expenditure (REE) and is an estimate of how many calories you would burn if you were to do nothing but rest. It represents the minimum amount of energy needed to maintain body temperature, heartbeat, and respiratory rate.

RSMI: This stands for Relative Skeletal Mass Index. RSMI represents the relative amount of muscle in the arms and legs compared against the patient's height and is calculated using the Baumgartner equation: $RSMI = (\text{lean mass of arms}[\text{kg}] + \text{lean mass of legs}[\text{kg}]) / (\text{height}[\text{m}]^2)$. RSMI on DXA can be useful to help screen for Sarcopenia.

SARCOPENIA: Sarcopenia is a disease associated with the aging process. Loss of muscle mass and strength affects balance, gait, and the ability to perform daily living tasks. Sarcopenia most commonly is seen in inactive people but can also affect individuals who remain physically active throughout their lives.

BMD: This stands for Bone Mineral Density and is calculated by dividing the BMC in grams by the projected area of the bone (measured size of the bone) in cm^2 ($BMD = BMC / AREA$). Both BMC and area are calculated by the DXA and results are displayed in g/cm^2 . A total body screening provides a patient's skeletal status and is compared against a reference population to determine a T and Z score.

REFERENCE POPULATION: Reference populations are based on ambulatory subjects from the general population who were free from chronic diseases affecting bone and who were not taking medications that influence bone (e.g., corticosteroids, anticonvulsants, thyroxin). Reference populations can be useful for comparing a BMD result against a young adult average to generate a T-score or against the average for the patient's age to generate a Z-score.

T-SCORE: The T-Score indicates how many standard deviations a patient's BMD is from the average BMD value of the healthy Young Adult reference population. A negative T-Score indicates the patient's BMD is below the Young Adult average value. A positive T-Score indicates the patient's BMD is above the Young Adult average value.

Z-SCORE: The Z-Score indicates how many standard deviations a patient's BMD is from the average BMD value of an individual with the same age and gender. Unlike a T-score that compares to the Young Adult average value, an Age Matched Z-score allows comparison to the reference population subjects of the same age and sex as the patient.

TOTAL BODY BMD: Though DXA systems are often used to make a clinical diagnosis of osteoporosis, a total body BMD is merely a bone density screening. Any test result, concern or further investigation should be discussed with a licensed medical doctor.

DEXA
EXAMPLE

FOLLOW-UP
REPORT
(SUBSEQUENT
TEST)

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Name: _____ Birth Date: _____ Height: 173.2 cm
 Patient ID: _____ Sex: _____ Measured: _____ Weight: 78.3 kg

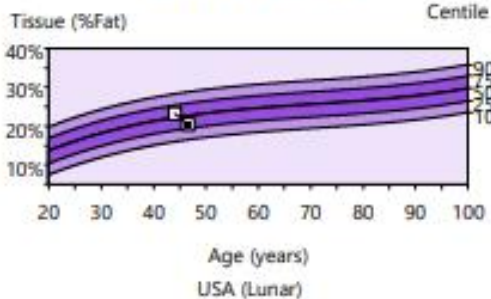
SHAPE TREND



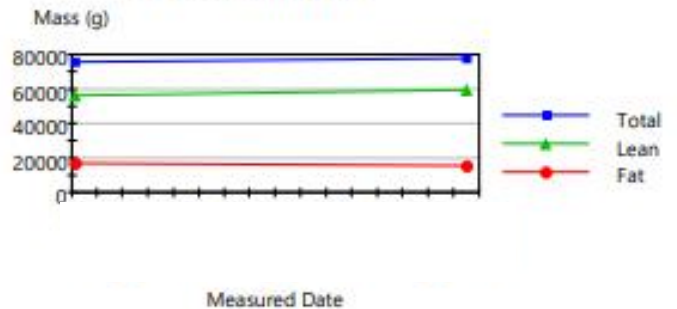
TOTAL BODY COMPOSITION HISTORY:

Measured Date	Total Mass (kg)	Change vs.		Fat Mass (g)	Change vs.		Lean Mass (g)	Change vs.		%Fat (%)	BMC (g)
		Baseline (kg)	Previous (kg)		Baseline (g)	Previous (g)		Baseline (g)	Previous (g)		
	75.6	baseline	-	16,950	baseline	-	56,069	baseline	-	23.2	2,610
	77.6	2.0	2.0	15,371	-1,579	-1,579	59,616	3,547	3,547	20.5	2,641

Total Body: Total



Composition Trend: Total

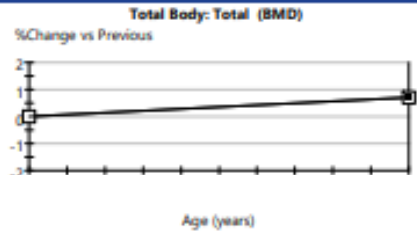


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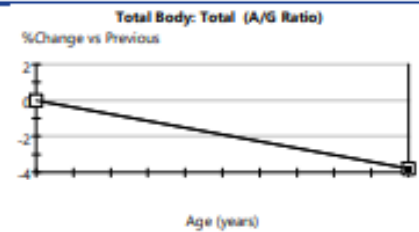
TREND RESULTS - BONE:

Measured Date	Measured Age	BMD T-Score	BMD Z-Score	BMD g/cm ²	Change vs. Previous	Change vs. Previous (%)	Change vs. Baseline	Change vs. Baseline (%)
		-0.7	-0.7	1.131	-	-	baseline	baseline
		-0.6	-0.6	1.139	0.008	0.7 %	0.008	0.7 %



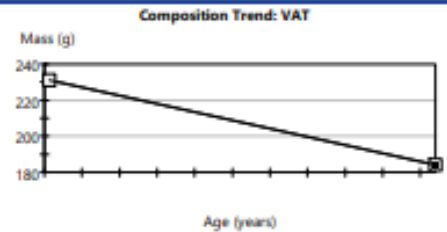
TREND RESULTS - ANDROID/GYNOID RATIO:

Measured Date	Measured Age	Android Tissue % Fat	Gynoid Tissue % Fat	Android/Gynoid Ratio	Change vs. Previous (%)	Change vs. Baseline (%)
		28.9 %	21.8 %	1.32	-	baseline
		24.8 %	19.5 %	1.27	-0.05	-0.05



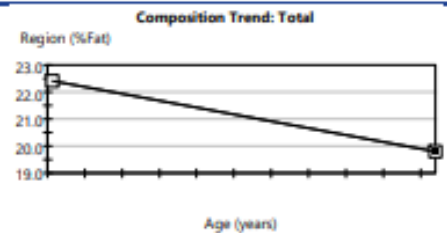
TREND RESULTS - VAT - VISCERAL ADIPOSE TISSUE:

Measured Date	Measured Age	VAT Mass	Change vs. Previous	Change vs. Previous (%)	Change vs. Baseline	Change vs. Baseline (%)
		231	-	-	baseline	baseline
		184	-47	-20.3 %	-47	-20.3 %

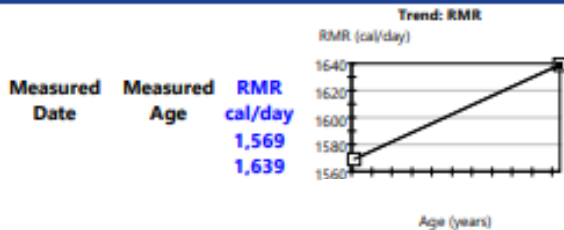


TREND RESULTS - TOTAL BODY % FAT:

Measured Date	Measured Age	Total Body Mass	Total Body Fat Mass	Total Body % Fat	Change vs. Previous	Change vs. Baseline
		75.6	16,950	22.4	-	baseline
		77.6	15,371	19.8	-2.6	-2.6



TREND RESULTS - RMR - RESTING METABOLIC RATE:



RSMI - RELATIVE SKELETAL MASS INDEX:

