MEDICAL POLICY

POLICY TITLE	WHOLE BODY DUAL X-RAY ABSORPTIOMETRY TO DETERMINE BODY COMPOSITION
POLICY NUMBER	MP 5.037

CLINICAL BENEFIT	☒ MINIMIZE SAFETY RISK OR CONCERN. ☒ MINIMIZE HARMFUL OR INEFFECTIVE INTERVENTIONS. ☐ ASSURE APPROPRIATE LEVEL OF CARE. ☐ ASSURE APPROPRIATE DURATION OF SERVICE FOR INTERVENTIONS. ☐ ASSURE THAT RECOMMENDED MEDICAL PREREQUISITES HAVE BEEN MET. ☐ ASSURE APPROPRIATE SITE OF TREATMENT OR SERVICE.
Effective Date:	**2/1/2024**

I. POLICY

Dual x-ray absorptiometry (DXA) body composition studies are considered **investigational.**

There is insufficient evidence to support a general conclusion concerning the health outcomes or benefits associated with this procedure.

Cross-reference:

MP 5.046 Vertebral Fracture Assessment and Trabecular Bone Score

II. PRODUCT VARIATIONS TOP

This policy is only applicable to certain programs and products administered by Capital Blue Cross and subject to benefit variations as discussed in Section VI. Please see additional information below.

FEP PPO: Refer to FEP Medical Policy Manual. The FEP Medical Policy manual can be found at:

https://www.fepblue.org/benefit-plans/medical-policies-and-utilization-management-guidelines/medical-policies

III. DESCRIPTION/BACKGROUND TOP

Using low dose x-rays of two different energy levels, whole body dual x-ray absorptiometry measures lean tissue mass, total and regional body fat, as well as bone density. DXA scans have become a tool for research on body composition (eg, as a more convenient replacement for underwater weighing). This evidence review addresses potential applications in clinical care rather than research use of the technology.

Body Composition Measurement

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Body composition measurements can be used to quantify and assess the relative proportions of specific body compartments such as fat and lean mass (eg, bones, tissues, organs, muscles). These measurements may be more useful in informing diagnosis, prognosis, or therapy than standard assessments (eg, body weight, body mass index) that do not identify the contributions of individual body compartments or their particular relationships with health and disease.

While these body composition measurements have been most frequently utilized for research purposes, they may be useful in clinical settings to:

- Evaluate the health status of undernourished patients, those impacted by certain disease states (eg, anorexia nervosa, cachexia), or those undergoing certain treatments (eg, antiretroviral therapy, bariatric surgery).
- Evaluate the risk of heart disease or diabetes by measuring visceral fat versus total body fat.
- Assess body composition changes related to growth and development (eg, infancy, childhood), aging (eg, sarcopenia), and in certain disease states (eg, HIV, diabetes).
- Evaluate patients in situations where body mass index is suspected to be discordant with total fat mass (eg, body-building, edema).

A variety of techniques have been researched, including most commonly, anthropomorphic measures, bioelectrical impedance, and dual-energy x-ray absorptiometry (DXA). All of these techniques are based in part on assumptions about the distribution of different body compartments and their density, and all rely on formulas to convert the measured parameter into an estimate of body composition. Therefore, all techniques will introduce variation based on how the underlying assumptions and formulas apply to different populations of subjects (ie, different age groups, ethnicities, or underlying conditions). Techniques using anthropomorphics, bioelectrical impedance, underwater weighing, and DXA are briefly reviewed below.

Anthropomorphic Techniques

Anthropomorphic techniques for the estimation of body composition include measurements of skinfold thickness at various sites, bone dimensions, and limb circumference. These measurements are used in various equations to predict body density and body fat. Due to its ease of use, measurement of skinfold thickness is one of the most common techniques. The technique is based on the assumption that the subcutaneous adipose layer reflects total body fat but this association may vary with age and sex.

Bioelectrical Impedance

Bioelectrical impedance analysis is based on the relation among the volume of the conductor (ie, human body), the conductor's length (ie, height), the components of the conductor (ie, fat and fat-free mass), and its impedance. Estimates of body composition are based on the assumption that the overall conductivity of the human body is closely related to lean tissue. The impedance value is then combined with anthropomorphic data to give body compartment measures. The technique involves attaching surface electrodes to various locations on the arm and foot. Alternatively, the patient can stand on the pad electrodes.

Underwater Weighing

Underwater weighing requires the use of a specially constructed tank in which the subject is seated on a suspended chair. The subject is then submerged in the water while exhaling. While valued as a research tool, weighing people underwater is typically not suitable for routine clinical use. This technique is based on the assumption that the body can be divided into 2 compartments with constant densities: adipose tissue, with a density of 0.9 g/cm^3, and lean body mass (ie, muscle and bone), with a density of 1.1 g/cm^3. One limitation of the underlying assumption is the variability in density between muscle and bone; eg, bone has a higher density than muscle, and bone mineral density varies with age and other conditions. Also, the density of body fat may vary, depending on the relative components of its constituents (eg, glycerides, sterols, glycolipids).

Dual-energy X-ray Absorptiometry

While the cited techniques assume 2 body compartments, DXA can estimate 3 body compartments consisting of fat mass, lean body mass, and bone mass. DXA systems use a source that generates x-rays at 2 energies. The differential attenuation of the 2 energies is used to estimate the bone mineral content and soft tissue composition. When 2 x-ray energies are used, only 2 tissue compartments can be measured; therefore, soft tissue measurements (ie, fat and lean body mass) can only be measured in areas in which no bone is present. DXA can also determine body composition in defined regions (ie, the arms, legs, and trunk). DXA measurements are based in part on the assumption that the hydration of fat-free mass remains constant at 73%. Hydration, however, can vary from 67% to 85% and can vary by disease state. Other assumptions used to derive body composition estimates are considered proprietary by DXA manufacturers.

Regulatory Status

Body composition software for several bone densitometer systems has been approved by the U.S. Food and Drug Administration (FDA) through the premarket approval process. They include the Lunar iDXA systems (GE Healthcare), Hologic DXA systems (Hologic), Mindways Software, Inc. systems (Mindways Software, Inc.), and Norland DXA systems (Swissray).

FDA product code: KGI.

IV. RATIONALE

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Summary of Evidence

For individuals who have a clinical condition associated with abnormal body composition who receive DXA body composition studies, the evidence includes systematic reviews and several cross-sectional studies comparing DXA with other techniques. Relevant outcomes are symptoms and change in disease status. The available studies were primarily conducted in research settings and often used DXA body composition studies as a reference standard; these studies do not permit conclusions about the accuracy of DXA for measuring body composition. A systematic review exploring the clinical validity of DXA against reference methods for the quantification of intra-abdominal adipose tissue raised concerns regarding precision and reliability. More importantly, no studies were identified in which DXA body composition

measurements were actively used in patient management. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have a clinical condition managed by monitoring changes in body composition over time who receive serial DXA body composition studies, the evidence includes several prospective studies monitoring patients over time. Relevant outcomes are symptoms and change in disease status. The studies used DXA as a tool to measure body composition and were not designed to assess the accuracy of DXA. None of the studies used DXA findings to make patient management decisions or addressed how serial body composition assessment might improve health outcomes. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

V. DEFINITIONS

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BODY COMPOSITION is the relative percentage of bony minerals, cell mass, lean body mass, body fat, and body water in an organism, and their distribution through the body. Determination of the specific gravity of the body is done to estimate the percentage of fat. This may be calculated by various methods, including underwater weighing, which determines the density of the individual; use of radioactive potassium, measuring the total body water by dilution of tritium; and use of various anthropometric measurements such as height, weight, and skin fold thickness at various sites.

BONE DENSITY OR BONE MINERAL DENSITY (BMD) is the average mineral concentration of a specimen of bone; skeletal mass. Bone mineral density is reduced in osteopenia and osteoporosis.

BODY FAT also called adipose tissue is connective tissue that has been specialized to store fat

LEAN TISSUE MASS is the weight of the body minus the fat content. It includes bones, muscles, and internal organs.

VI. BENEFIT VARIATIONS

TOP

The existence of this medical policy does not mean that this service is a covered benefit under the member's health benefit plan. Benefit determinations should be based in all cases on the applicable health benefit plan language. Medical policies do not constitute a description of benefits. A member's health benefit plan governs which services are covered, which are excluded, which are subject to benefit limits and which require preauthorization. There are different benefit plan designs in each product administered by Capital Blue Cross. Members and providers should consult the member's health benefit plan for information or contact Capital Blue Cross for benefit information.

VII. DISCLAIMER

TOP

Capital Blue Cross's medical policies are developed to assist in administering a member's benefits, do not constitute medical advice and are subject to change. Treating providers are solely responsible for medical advice and treatment of members. Members should discuss any medical policy related to their coverage or condition with their provider and consult their benefit

information to determine if the service is covered. If there is a discrepancy between this medical policy and a member's benefit information, the benefit information will govern. If a provider or a member has a question concerning the application of this medical policy to a specific member's plan of benefits, please contact Capital Blue Cross' Provider Services or Member Services. Capital Blue Cross considers the information contained in this medical policy to be proprietary and it may only be disseminated as permitted by law.

VIII. CODING INFORMATION

TOP

Note: This list of codes may not be all-inclusive, and codes are subject to change at any time. The identification of a code in this section does not denote coverage as coverage is determined by the terms of member benefit information. In addition, not all covered services are eligible for separate reimbursement.

Investigational when used to report a DXA body composition study as noted in the policy guidelines above; therefore, not covered:

Procedure Codes								
76499								

IX. REFERENCES

TOP

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X. POLICY HISTORY

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MP 5.037	**3/4/20 Consensus review**. Policy statement unchanged. Coding reviewed. References updated. Revised language under product variations, benefit variations and disclaimer sections.
	11/29/21 Consensus review. Updated FEP, Background, Rationale, and References. No changes to policy statement or coding.
	12/27/2022 Consensus review. No changes to statement or coding. Updated cross-reference and references.
	10/13/2023 Consensus review. No change to statement. Updated references.