
Medical Policy



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Please reference the appropriate certificate or contract for benefit information. This policy may be updated and is therefore subject to change.

***Current Policy Effective Date: 7/1/26**

(See policy history boxes for previous effective dates)

Title: Skin Advanced Glycation End Products (AGE) Measurement By Multi-Wavelength Fluorescent Spectroscopy

Description

Skin auto fluorescence readers (AFR) use autofluorescence technology to quantify Advanced Glycation End products (AGEs) in the skin, which serve as biomarkers of metabolic stress and are linked to the development of age-related diseases. While certain AGEs exhibit distinct fluorescent properties, called autofluorescence, that can be detected in tissue, traditional measurement of AGE accumulation has required invasive tissue biopsies followed by fluorescent spectroscopy analysis. Manufacturers are proposing that the AGE Reader can predict the risk of cardiovascular disease, diabetes, and renal failure.

Medical Policy Statement

Skin autofluorescence spectroscopy has not been shown to demonstrate significant clinical benefit or predictive value beyond the current standards of care and is experimental/investigational. There is insufficient evidence to determine that the technology results in an improvement in net health outcomes.

Inclusionary and Exclusionary Guidelines

N/A

CPT/HCPCS Level II Codes *(Note: The inclusion of a code in this list is not a guarantee of coverage. Please refer to the medical policy statement to determine the status of a given procedure)*

Established codes:

N/A

Other codes (investigational, not medically necessary, etc.):

88749

Background

Advanced glycation end products (AGEs) are harmful compounds that are created as a result of glycation, a process by which proteins or fats combine with sugars in the bloodstream. AGEs accumulate in the walls of cells and can alter cellular structure and function by interacting with receptors on a cell's surface. Damage is caused when the protein structure and function is altered. The inflammation caused is believed to be a primary contributor to chronic inflammation. High levels of AGEs have been linked to diseases including diabetes, heart disease, Alzheimer's, sporadic forms of Parkinson's disease, renal failure, and various metabolic diseases. Due to their effect on cells structure and function, AGEs are thought to be sensitive biomarkers that can be used to determine the risk of developing multiple age-related diseases.

Measurement of skin autofluorescence is obtained by positioning the ventral side of the forearm on a small window of a box containing an excitation ultraviolet A light source. Reflected light from an area of skin measuring approximately 1-4 cm² and emission light are measured with a spectrometer. The fluorescence intensity is related with the concentration of skin AGE. Auto fluorescence is calculated by dividing the average light intensity of the emission spectrum (420-600 nm) by the average light intensity of the excitation spectrum (300-420 nm) multiplied by 100 and expressed in arbitrary units (AU). The normal reference range of AGE levels increases with the age group being tested, as AGEs accumulate in the body as a result of the normal aging process. AGE values, as expressed in AU, are considered normal at 2.0-2.2 or below. According to the developers of AFR technology, those individuals with higher scores can expect to experience a higher incidence of morbidity and have a shorter life expectancy than those with normal scores.

The developers of the AFR system report that it is designed to provide a more accurate and convenient method of screening for diabetes, as well as a variety of other conditions, based on the presence of AGE biomarkers found in skin. Proponents of this technology claim that results obtained from AFR devices can help to identify those individuals at high risk for diabetic and related cardiovascular complications.

Literature indicates that although studies have revealed a strong association between the accumulation of AGEs and the occurrence/worsening of metabolic diseases, the routine use of multi-wavelength fluorescent spectroscopy for the diagnosis or monitoring of local and general disease has not yet been determined.

Summary of Evidence

The current medical literature provides limited evidence for the clinical usefulness of non-invasive skin AGE (advanced glycation end-product) measurement. While many studies report a correlation between higher skin autofluorescence (AF) and chronic conditions such as diabetes, renal impairment, and possibly atherosclerosis, the specific AGEs responsible for disease pathogenesis remain unidentified, and causal links are largely speculative. Researchers acknowledge a consistent association between skin AF and glycemic control and long-term diabetic complications, yet they also note that AGE accumulation is influenced by other factors like oxidative stress, and not all AGEs are fluorescent. Because AF reflects overall fluorescence rather than precise concentrations of individual AGE compounds, its specificity and predictive value as an independent screening tool are uncertain. Moreover, the American Diabetes Association's Standards of Medical Care in Diabetes do not include AGEs or autofluorescence spectroscopy as recommended screening methods. Consequently, the role of skin autofluorescence in disease prediction and clinical practice remains unclear and warrants further investigation. There is insufficient evidence to determine that the technology results in an improvement in net health outcomes.

Rationale

There is insufficient data in the medical literature demonstrating the clinical utility of noninvasive measurement of skin AGE concentrations. Overall, studies have concluded that there is a correlation between increased skin AGEs and some chronic disease states, but it is not known which AGEs play roles in the pathogenesis of conditions such as diabetes and atherosclerosis. The causal relationships between skin autofluorescence AGE formation and various disease states are speculative.

According to the available literature, researchers tend to agree that there is a clinical correlation between skin autofluorescence and glycemic control, long-term complications in diabetes and renal function. However, researchers note that other mechanisms exist that contribute to AGE accumulation, such as oxidative stress reactions; therefore, the validity of AFR as a clinical screening tool and independent predictor of specific diseases is unclear. Additionally, not all AGEs exhibit fluorescent properties. Since fluorescence itself does not provide quantitative information on concentrations of individual AGE compounds, this lack of specificity presents challenges in establishing the clinical utility of AFR. Overall, the literature suggests that the significance of skin autofluorescence as a meaningful screening tool remains uncertain and its role as a predictive measure requires further investigation.

The American Diabetes Association's position statement on Standards of Medical Care in Diabetes does not mention AGEs or autofluorescence spectroscopy as screening measures for diabetes.

Regulatory Status:

The U.S. Food and Drug Administration (FDA) has not approved any autofluorescence readers (AFR) for marketing in the United States that are proposed to predict the risk of cardiovascular disease, diabetes, or renal failure. The AGE Reader™ (DiagnOptics) device received CE certification in Europe in 2006 and the manufacturer reports that it will seek additional regulatory approvals in other regions. Veralight, Inc. received CE mark approval of the Scout DS® system for noninvasive diabetes screening in 2011.

Government Regulations National/Local:

Medicare has no national or local coverage determination for this technology.

(The above Medicare information is current as of the review date for this policy. However, the coverage issues and policies maintained by the Centers for Medicare & Medicare Services [CMS, formerly HCFA] are updated and/or revised periodically. Therefore, the most current CMS information may not be contained in this document. For the most current information, the reader should contact an official Medicare source.)

Related Policies

N/A

References

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The articles reviewed in this research include those obtained in an Internet based literature search for relevant medical references through April 1, 2026, the date the research was completed.

Joint BCBSM/BCN Medical Policy History

Policy Effective Date	BCBSM Signature Date	BCN Signature Date	Comments
3/1/11	1/25/11	1/4/11	Joint policy established
9/1/12	6/12/12	6/19/12	Routine maintenance
1/1/14	10/17/13	10/25/13	Routine maintenance
5/1/15	2/17/15	2/27/15	Routine maintenance
7/1/16	4/19/16	4/19/16	Routine maintenance Deleted code 0233T Added NOC code
7/1/17	4/18/17	4/18/17	Routine maintenance
7/1/18	4/17/18	4/17/18	Routine maintenance
7/1/19	4/16/19		Routine maintenance
7/1/20	4/14/20		Routine maintenance
7/1/21	4/20/21		Routine maintenance
7/1/22	4/19/22		Routine maintenance
7/1/23	4/18/23		Routine maintenance (slp) Vendor Managed: N/A
7/1/24	4/16/24		Routine maintenance (slp) Vendor managed: N/A
7/1/25	4/15/25		Routine maintenance (slp) Vendor managed: N/A
7/1/26	4/21/26		Routine maintenance (slp/no) Vendor managed: N/A MPS updated to current language Policy reformatted

Next Review Date: 2nd Qtr, 2027

BLUE CARE NETWORK BENEFIT COVERAGE
POLICY: SKIN ADVANCED GLYCATION END PRODUCTS (AGE) MEASUREMENT BY
MULTI-WAVELENGTH FLUORESCENT SPECTROSCOPY

I. Coverage Determination:

Commercial HMO (includes Self-Funded groups unless otherwise specified)	Not covered.
BCNA (Medicare Advantage)	Refer to the Medicare information under the Government Regulations section of this policy.
BCN65 (Medicare Complementary)	Coinsurance covered if primary Medicare covers the service.

II. Administrative Guidelines:

- The member's contract must be active at the time the service is rendered.
- Coverage is based on each member's certificate and is not guaranteed. Please consult the individual member's certificate for details. Additional information regarding coverage or benefits may also be obtained through customer or provider inquiry services at BCN.
- The service must be authorized by the member's PCP except for Self-Referral Option (SRO) members seeking Tier 2 coverage.
- Services must be performed by a BCN-contracted provider, if available, except for Self-Referral Option (SRO) members seeking Tier 2 coverage.
- Payment is based on BCN payment rules, individual certificate and certificate riders.
- Appropriate copayments will apply. Refer to certificate and applicable riders for detailed information.
- CPT - HCPCS codes are used for descriptive purposes only and are not a guarantee of coverage.