Medical Policy

Blue Cross Blue Shield Blue Care Network of Michigan

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Category: Medicine
***Current Policy Effective Date: 1/1/09**

Title: Computer Probability Analysis (e.g., Multivariate Analysis)

Procedure Code(s): 0185T

Description / Background

Multivariate data analysis refers to any statistical technique used to analyze data that arises from more than one variable. This essentially models reality where each situation, product or decision involves more than a single variable. The information age has resulted in masses of data in every field. Despite the quantum of data available, the ability to obtain a clear picture of what is going on and make intelligent decisions is a challenge. When available information is stored in database tables containing rows and columns, multivariate analysis can be used to process the information in a meaningful fashion.

Multivariate analysis methods are typically used for:

- Consumer and market research
- Quality control and quality assurance across a range of industries such as food and beverage, paint, pharmaceuticals, chemicals and telecommunications
- Process optimization and control
- Research and development

Multivariate analysis uses a set of methods dedicated to the analysis of data sets with more than one variable. Several of these techniques were developed recently in part because they require the computational capabilities of modern computers. These processes, however, are not often unified and the choice of proper method is challenging.

Multivariate analysis of patient specific findings is most commonly used to predict risk factors, occurrence rates and so on. This process is commonly used in public health for stratifying

(*See policy history boxes for any previous effective dates, if applicable)

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possible outbreaks based on current and historical data. Computer probability analysis can also be used in any area of medicine that a provider would like to explore the probability of occurrence. For example, if a provider, such as a physician practice or outpatient facility, were so inclined to determine possible mortality rates related to certain surgeries, this type of probability analysis would prove useful. The information obtained from the analysis would assist the provider to develop outcome measures related to the variants.

CPT / HCPCS Level II Codes and Description *(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.):

0185T* Multivariate analysis of patient specific findings with quantifiable computer probability assessment, including report

(*Do not report in conjunction with 99090)

Diagnoses / Medical Conditions

None specified

Medical Policy Statement

Multivariate analysis of data pertaining to patient-specific findings, utilizing more than one variable with quantifiable computer probability is used in conjunction with other evaluation tools. The use of computer probability analysis pertaining to patient-specific findings is considered not medically necessary to the primary service provided (e.g., emergency room service, office visit, etc.).

Rationale

Multivariate analysis (MVA) is based on the statistical principle of multivariate statistics, which involves observation and analysis of more than one statistical variable at a time. In design and analysis, the technique is used to perform trade studies across multiple dimensions while taking into account the effects of all variables on the responses of interest. Uses for multivariate analysis include:

- Design for capability (also known as capability-based design)
- Inverse design, where any variable can be treated as an independent variable
- Analysis of alternatives, the selection of concepts to fulfill a customer need
- Analysis of concepts with respect to changing scenarios

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- Identification of critical design drivers and correlations across hierarchical levels

Multivariate analysis can be complicated by the desire to include physics-based analysis to calculate the effects of variables for a hierarchical "system-of-systems." Often, studies that wish to use multivariate analysis are stalled by the dimensionality of the problem. These concerns are often eased through the use of surrogate models, highly accurate approximations of the physics-based code. Since surrogate models take the form of an equation, they can be evaluated very quickly.

Medical Policy Position Summary (Non-clinical summary statement for customer use)

There are different methods for converting data into useful information. This can include the use of graphical methods, displaying the data in tables, simple statistical methods and more complex statistical analysis such as the multi-variant analysis used in computer probability analysis. Although more complex, the output of a computer probability analysis still requires clinical judgment and shared decision making with the patient before a treatment is given. Medical decision making is a component of an evaluation and management service. Data review and analysis by computer probability analysis or other methods are inherently a part of the problem-solving that occur in medical decision making. Additionally, the American Medical Association (AMA) states that all procedural codes include the evaluation and management services associated with performing the procedure. Therefore, computer probability analysis is considered not medically necessary to the medical decision making that is incorporated into the primary (other) services provided to the patient.

Inclusionary and Exclusionary Guidelines (Clinically based guidelines that may support individual consideration and pre-authorization decisions)

N/A

Related Policies

N/A

Medicare Information

There is no national or local Medicare coverage determination regarding this topic.

(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 & Medicaid 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.)

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References

- Abdi, Hervé, "Multivariate Analysis," *The University of Texas at Dallas*, 2003, < http://www.utdallas.edu/~herve/Abdi-MultivariateAnalysis-pretty.pdf >, (March 13, 2008).
- Buck, Jessica, et al., "Community-associated Methicillin-resistant *Staphylococcus aureus*, Minnesota, 2000-2003," *Emerging Infectious Diseases*, Vol. 11, No. 10, October 2005, pp. 1532-1538.
- Fukui, Shinji, et al., "Multivariate Analysis of Risk Factors for QT Prolongations Following Subarachnoid Hemorrhage," *Critical Care*, Vol. 7, No. 3, 2003, pp. 7-12.
- Kline, Jeffrey, et al., "Pretest Probability Assessment derived from Attribute Matching," *BMC Medical Informatics and Decision Making,* Vol. 5, No. 26, 2005, page numbers not available for citation.
- Kline, Jeffrey, et al., "Use of Pulse Oximetry to Predict In-Hospital Complications in Normotensive Patients with Pulmonary Embolism," *American Journal of Medicine*, Vol. 115, No. 3, 2003, pp. 203-208.
- Larraz-Mora, Elena, et al., "Open Biliary Tract Surgery: Multivariate Analysis of Factors Affecting Mortality," *Digestive Surgery*, Vol. 16, No. 3, 1999, pp. 204-208.
- Reilly, Brendan M., MD, et al., "Impact of a Clinical Decision Rule on Hospital Triage of Patients with Suspected Acute Cardiac Ischemia in the Emergency Department," *JAMA,* Vol. 288, No. 3, 2002, pp. 342-350.

The articles reviewed in this research include those obtained in an Internet based literature search for relevant medical references through June 23, 2008, the date the research was completed.

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Joint BCBSM/BCN Medical Policy History

Policy Effective Date	BCBSM Signature Date	BCN Signature Date	Comments
1/1/09	10/21/08	11/01/08	Joint policy established

This is service is incidental to services provided. This is an established policy and no longer subject to periodic review.

Pre-Consolidation Medical Policy History

Original Policy Date	Comments
BCN: N/A	Revised: N/A
BCBSM: N/A	Revised: N/A

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BLUE CARE NETWORK BENEFIT COVERAGE POLICY: COMPUTER PROBABILITY ANALYSIS

I. Short Description

There are different methods for converting data into useful information. This can include the use of graphical methods, displaying the data in tables, simple statistical methods and more complex statistical analysis such as the multi-variant analysis used in computer probability analysis. Although more complex, the output of a computer probability analysis still requires clinical judgment and shared decision making with the patient before a treatment is given. Medical decision making is a component of an evaluation and management service. Multivariate analysis of data pertaining to patient-specific findings, utilizing more than one variable with quantifiable computer probability is used in conjunction with other evaluation tools. The use of computer probability analysis pertaining to patient-specific findings is considered not medically necessary to the primary service(s) provided (e.g., emergency room service, office visit, etc.).

II. Coverage Determination:

Commercial HMO (includes Self-Funded groups unless otherwise specified)	Not covered
BCNA (Medicare Advantage)	Not covered
BCN65 (Medicare Complementary)	Not covered
BlueCaid	Not covered

III. Administrative Guidelines:

N/A

IV. Effective Dates:

Policy updated:
JUMP policy effective date: 1/1/09

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