

# DOWNLOAD PDF MULTIVARIATE INTERPRETATION OF CLINICAL LABORATORY DATA

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Our objective was to determine if using a combination of laboratory, demographic, and clinical parameters improves the accuracy of classification of these disorders. Chart data were collected for patients with physician-ordered iPTH and total calcium tests. Classification was done using 3 approaches: The CART model was developed using the gold standard patient classification and validated using leave-one-out cross-validation. The CART model used 6 of 24 variables iPTH, calcium, creatinine, renal transplantation, percentage of females, and urea nitrogen and had a misclassification error rate of 0. Classification of disorders of calcium homeostasis based on the PTH nomogram can be improved by using the CART model developed in this study. Parathyroid hormone PTH is frequently measured in patients with abnormal calcium levels to evaluate the cause of the disorder. In cases of PTH-independent hypercalcemia, patients have a low serum PTH level with hypercalcemia due to tumor secretion of PTH-related peptide, bone metastasis, or ectopic vitamin D production, as in sarcoidosis or other granulomatous diseases. This can result from surgical parathyroidectomy, autoimmune destruction, congenital lack of parathyroid glands Di George syndrome , or parathyroid infiltration, as in hemochromatosis. The understanding of the pathophysiology of calcium homeostasis disorders has been facilitated by advances in PTH testing methods. These limitations were addressed in the s with the development of second-generation PTH assays. Second-generation assays detect the biologically active iPTH and have reduced cross-reactivity with biologically inactive or inversely bioactive fragments. This led to development of dynamic reference intervals in which the PTH level is evaluated in the context of the serum calcium concentration. Some laboratories continue to report PTH nomogram interpretations as an added service to guide physician decisions. Cases that did not clearly cluster within a single group were identified as indeterminate. In the present study, we sought to develop a multivariate model for classification of calcium homeostasis disorders using a combination of laboratory, demographic, and clinical data. We used 2 multivariate predictive models, the classification and regression tree CART and logistic regression. The CART model is a recursive partition method used to predict discrete outcomes from 1 or more predictors. New partitions are split into 2 until no more useful splits can be identified. This method has the advantage of easy interpretation and has often been used for clinical decision algorithms. Logistic regression identifies relationships between a discrete outcome such as group membership and some independent variables such as age and sex. The accuracy of the CART and logistic regression multivariate models was compared with the PTH nomogram for classification of multiple calcium homeostasis disorders.

**Materials and Methods**

**Study Specimens** This was a retrospective study using data from consecutively received serum specimens sent to the laboratory for physician-ordered calcium and PTH tests. These specimens included specimens from any patients being monitored or studied for various calcium homeostasis disorders. Chart review consisted of collecting laboratory 21 variables , demographic 3 variables , and clinical 11 variables data as follows: Charts were also reviewed for clinical history of malignancy, renal transplantation, renal failure, endocrine abnormalities adrenal disease, thyroid disease, and other pituitary or hypothalamic disease , parathyroid adenoma, granulomatous disease, prolonged immobilization, bone disease osteoporosis, Paget disease , malabsorption, pancreatic disease, and gastric bypass surgery. Ionized calcium was measured by using the Radiometer ABL Radiometer America, Cleveland, OH , and total hydroxyvitamin D and 1,25 dihydroxyvitamin D were measured by liquid chromatography tandem mass spectrometry.

**Classification of Disorders of Calcium Homeostasis Disorders** were classified by using 3 approaches: The performance of the PTH nomogram was compared with the multivariate models based on the accuracy of each against the gold standard classification. The logistic regression models the posterior probabilities of all of the different classes via linear functions of independent variables. Each sample is classified to the group with the

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highest posterior probability. Where there are a total of  $K$  classes, logistic regression models the posterior probabilities of the  $K$  classes via a linear function in  $x$ , where  $x$  is a vector of predictors. The logistic regression models posterior probabilities as follows:

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## Chapter 2 : Multivariate Interpretation of Clinical Laboratory Data - CRC Press Book

*Book Review Multivariate interpretation of clinical laboratory data. Adelin Albert and Eugene K. Harris, Marcel Dekker inc., New York, no. of pages: price.*

Vesk, Mark Westoby , " The aim of this study was to identify whether plant species show consistent responses to livestock grazing. The analyses were based on 35 published studies from Australian rangelands providing 55 species response lists. The primary data set comprised responses from species. Eight-hundred and twenty-nine species were categorized as increasers, decreasers or neutral under grazing. Show Context Citation Context Specificity can be improved by measuring free and total PSA and by combining these results with clinical findings. Methods such as neural networks and logistic regression are alternatives to multistep algorithms for clinical use of the combined findings. We compared multilayer perceptron MLP and logistic regression LR analysis for predicting prostate cancer in a screening population of men, ages 55-66 years. Explanatory variables considered were age, free and total PSA and their ratio, digital rectal examination DRE , transrectal ultrasonography, and a family history of prostate cancer. The diagnostic contribution of cervical tissue fluorescence spectra acquired in vivo at and nm excitation were analyzed using a general multivariate statistical algorithm. The primary steps of the algorithm are to: The algorithm was tested on cervical tissue spectra acquired from sites at nm excitation and from sites at nm excitation. Klein Gebbinck , " Ultrasonic tissue characterization is a technique where on the basis of parameters that have been acquired using ultrasound it is tried to derive some properties of the tissue under observation. At the Biophysics Laboratory of the Institute of Ophthalmology at the Academic Hospital Nijmegen the applicability of this technique for the diagnosis of diffuse liver diseases is investigated. An important component of a diagnostic system is the algorithm that classifies the patients into one of the to be discriminated groups. Uptil now discriminant analysis, which is a statistical method, has been used as classifier, but neural networks are known to perform this task also very well. In this thesis two types of neural networks, back-propagation and feature mapping, are investigated with regard to their classifying capabilities. It is shown that with back-propagation better results can be achieved than with discriminant analysis. One of the problems when dealing with neural networks is that the All measurements conducted on eleven samples of New Zealand white rabbit animal model aorta. The experimental group consisted of four atherosclerotic aorta samples, while seven healthy aortic wall specimens served as controls. The apparatus used was a dual beam diffuse reflectance spectrometer, equipped with a fiber optic cable. From measured diffuse reflectance and total transmittance the diffuse scattering and absorption coefficients were calculated via the inverse Kubelka-Munk Model. For the credibility of the adopted categorization method Kolmogorov-Smirnov test, F-test and t-test were applied. The basis for categorizing the measured and calculated data was the Probability Ratio Prothrombin Times in Monitoring Oral Anticoagulant Therapy by unknown authors " Despite careful monitoring of oral anticoagulant treatment OAT , some international normalized ratio INR for pro-thrombin time values will fall outside the therapeutic range. Considerable changes in serial INR results from OAT patients may be caused by random fluctuation alone, and, for statistical reasons, a fraction of the INR values will fall outside therapeutic range and interfere with dose adjustments. On the basis of therapeutic intervals and statistical evaluation of reference changes, we suggest and discuss an alternative method for interpretation of serial INR measurements. When a dose was adjusted on the basis of insignificant change in INR value, the subsequent INR value generally fell in the opposite direction. If a further change of INR values is taken into account estimates of total in-treatment variation may improve the precision of the forecasting of TDM systems. This method, however, is still based on the assumption of random fluctuation

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## Chapter 3 : CiteSeerX " Citation Query Multivariate interpretation of clinical laboratory data

*The intelligent data analysis on the clinical parameter dataset has shown that when a complex system is considered as a multivariate one, the information about the system substantially increases. All these results support an idea that probably a general health indicator could be constructed taking into account the existing classification groups.*

## Chapter 4 : Multivariate Interpretation of Clinical Laboratory Data: 1st Edition (Hardback) - Routledge

*Multivariate Statistical Interpretation of Laboratory Clinical Data values are taken into consideration should be related rather to the enzyme indicator values (AST, ALT, GGT, LDH, CK) rather.*

## Chapter 5 : The multivariate reference range: an alternative interpretation of multi-test profiles.

*Multivariate Interpretation of Clinical Laboratory Data (Statistics: A Series of Textbooks and Monographs) by Adelin Albert and a great selection of similar Used, New and Collectible Books available now at [www.nxgvision.com](http://www.nxgvision.com)*

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