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(54) Title: ILLNESS SPECIFIC DIAGNOSTIC SYSTEM

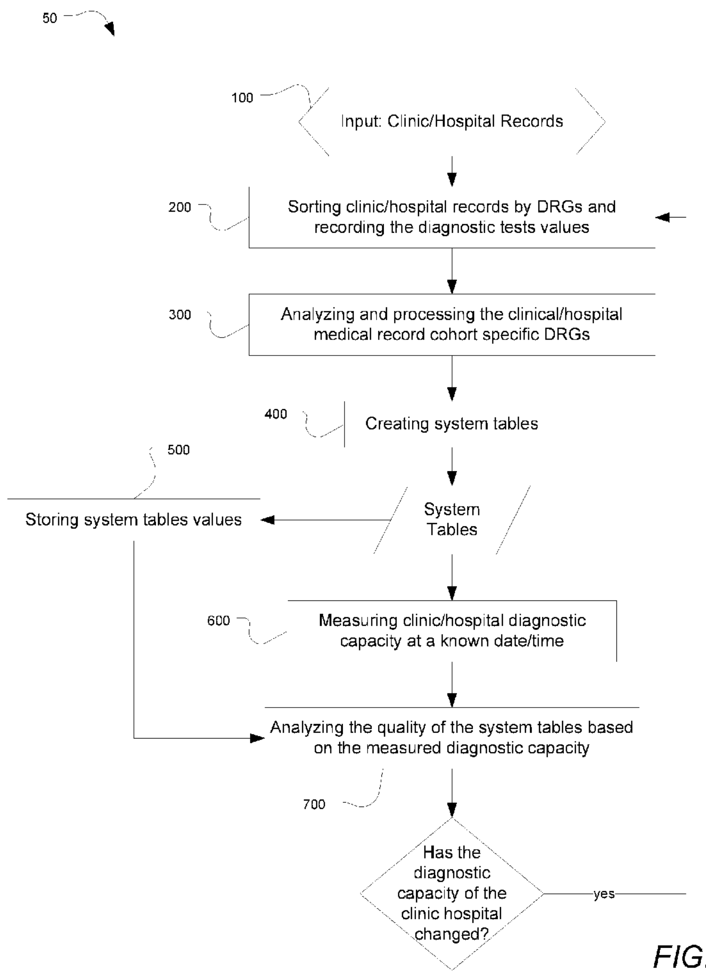

FIG. 1

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(57) Abstract: A method for diagnosing diseases in human subjects and a computer system implementing the method. The novel method uses historical patient medical records to create tables, which are used by a medical center to determine what diagnostic test is associated with confirmation of a disease in question. The method provides nonparametric, retrospective, disease cohort, rank ordered, weighted concatenation tables, which are unique to a disease and specific to the medical center where they are created, with prospective application. The method is more efficient and effective than presently used methods.

ILLNESS SPECIFIC DIAGNOSTIC SYSTEM

CROSS REFERENCE TO RELATED APLICATIONS

This application is a Continuation of prior filed U.S. Patent Application No. 12/610,702, filed on November 2, 2009, which claims the benefit of U.S. Provisional Patent Application 61/162,468, filed on March 23, 2009, which are both incorporated herein by reference.

FIELD OF INVENTION

This invention relates to the field of disease diagnosis.

BACKGROUND

Efficient orderly resource management of diagnostic tests in human disease is a resistant problem. Many diagnostic tests applied on human patient populations carry an element of risk. The decision matrix by which diagnosticians reduce symptoms to specific diagnostic tests varies due to differences in medical centers' diagnostic capacities. Health Maintenance Organization (HMOs), Preferred Physician Providers Organizations (PPOs), and others' methods introduced to reduce healthcare resource consumption by fiscal means have primarily failed as measured by the gross national product. What is needed in the medical arts is an improved method of disease diagnosis that is more effective and efficient than methods currently employed by diagnostic centers.

SUMMARY OF INVENTION

The present invention, called the Illness Specific Diagnostic System, includes an innovative scientific method to diagnosis diseases in human beings. System tables, created by the novel method, assist diagnosticians at a specific medical center select the most accurate and precise diagnostic test for a specific disease. The system does not use decision trees, but instead uses DIAGNOSIMETRICS™, the application of quantitative analysis to the art of disease diagnosis, as the method for construction of non-parametric, retrospective, disease-cohort, rank-ordered, weighted concatenation tables unique to a disease and specific to the medical center where they are created. The system destroys the myth of a single medical standard of care, and focuses the diagnostician as the individual most capable of diagnosing disease(s) in human beings. A computer system implementing the novel method is also presented.

In an embodiment, the method of determining the suitability of a diagnostic test for confirmation of a disease in humans comprises obtaining disease treatment results for patients grouped by disease in a Diagnostic Related Group (DRG) and obtaining diagnostic tests corresponding to each patient, each diagnostic test having a test result selected from the group comprising a positive result, a negative result, and an equivocal result. The method further comprises retrieving a first result for a first diagnostic test performed for each of the patients and a second result for a second diagnostic test performed for each of the patients, and transforming the first and second results to create a system value by solving for $[\text{sign}]\left[abs\left(\log\left(X+\frac{1}{N}\right)\right)-\log(Y+N)\right]*(1-(N-T))*(X+T)$, where X is the number of positive results for the first diagnostic test, Y is the number of negative results for the first diagnostic test, T is the total number of positive results, negative results, and equivocal results for the first diagnostic test, and N is the total number of positive results, negative results, and equivocal results for the first diagnostic test and positive results, negative results, and equivocal results for the second diagnostic test. The system value represents the suitability of the diagnostic test for confirmation of the disease.

In another embodiment, the computer system adapted to determine the suitability of a diagnostic test for confirmation of a disease in humans comprises a processor, and a tangible memory storage including software instructions that cause the computer system to perform: obtaining disease treatment results for patients grouped by disease in a Diagnostic Related Group (DRG) and obtaining diagnostic tests corresponding to each patient, each diagnostic test having a test result selected from the group comprising a positive result, a negative result, and an equivocal result. The software instructions cause the computer system to further perform: retrieving a first result for a first diagnostic test performed for each of the patients and a second result for a second diagnostic test performed for each of the patients, and transforming the first and second results to create a system value by solving for $[\text{sign}]\left[abs\left(\log\left(X+\frac{1}{N}\right)\right)-\log(Y+N)\right]*(1-(N-T))*(X+T)$, where X is the number of positive results for the first diagnostic test, Y is the number of negative results for the first diagnostic test, T is the total number of positive results, negative results, and equivocal results for the first diagnostic test, and N is the total number of positive results, negative results, and equivocal results for the first diagnostic test and positive results, negative results, and equivocal results for the second diagnostic test. The system value represents the suitability of the diagnostic test for confirmation of the disease, whereby the computer system determines the suitability of a diagnostic test for confirmation of a disease in humans.

In an additional embodiment, the method of determining the suitability of a diagnostic test for confirmation of a disease in humans comprises obtaining disease treatment results for patients grouped by disease in a Diagnostic Related Group (DRG) and obtaining diagnostic tests corresponding to each patient, each diagnostic test having a test result selected from the group comprising a positive result, a negative result, and an equivocal result. The method further comprises retrieving a first result for a first diagnostic test performed for each of the patients and a second result for a second diagnostic test performed for each of the patients, and transforming the first and second results to create a system value by solving for $[\text{sign}]\left[abs\left(\log\left(X+\frac{1}{N}\right)\right)-\log\left(Y+\frac{1}{N}\right)\right]\left(1-\frac{Z}{N}\right)$, where X is the number of positive results for the first diagnostic test, Y is the number of negative results for the first diagnostic test, T is the total number of positive results, negative results, and equivocal results for the first diagnostic test, N is the total number of positive results, negative results, and equivocal results for the first diagnostic test and positive results, negative results, and equivocal results for the second diagnostic test, and Z is the number of patients not receiving the diagnostic test. The system value represents the suitability of the diagnostic test for confirmation of the disease.

In a further embodiment, the computer system adapted to determine the suitability of a diagnostic test for confirmation of a disease in humans comprises a processor, and a tangible memory storage including software instructions that cause the computer system to perform: obtaining disease treatment results for patients grouped by disease in a Diagnostic Related Group (DRG) and obtaining diagnostic tests corresponding to each patient, each diagnostic test having a test result selected from the group comprising a positive result, a negative result, and an equivocal result. The software instructions cause the computer system to further perform: retrieving a first result for a first diagnostic test performed for each of the patients and a second result for a second diagnostic test performed for each of the patients, and transforming the first and second results to create a system value by solving for $[\text{sign}]\left[abs\left(\log\left(X+\frac{1}{N}\right)\right)-\log\left(Y+\frac{1}{N}\right)\right]\left(1-\frac{Z}{N}\right)$, where X is the number of positive results for the first diagnostic test, Y is the number of negative results for the first diagnostic test, T is the total number of positive results, negative results, and equivocal results for the first diagnostic test, N is the total number of positive results, negative results, and equivocal results for the first diagnostic test and positive results, negative results, and equivocal results for the second diagnostic test, and Z is the number of patients not receiving the diagnostic test. The system value represents the suitability of the diagnostic test for confirmation of the disease, whereby the computer system determines the suitability of a diagnostic test for confirmation of a disease in humans.

BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the invention, reference should be made to the following detailed description, taken in connection with the accompanying drawings, in which:

FIG. 1 is a flowchart showing an overview of the system.

FIG. 2 is a flowchart showing an overview of the system's quality control feedback loop.

FIG. 3 is a graph illustrating the transformation of the positive system value (Dp), or system value, into the first quadrant Cartesian system. The ordinate axis is the system value, and the abscissa is the number of disease specific cohort tests results.

FIGS. 4A-4D are four continuous parts of an example system table in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In the following detailed description of the preferred embodiments, reference is made to the accompanying drawings, which form a part hereof, and within which are shown by way of illustration specific embodiments by which the invention may be practiced. It is to be understood that other embodiments may be utilized and structural changes may be made without departing from the scope of the invention.

The present invention, called the Illness Specific Diagnostic System, provides a system for the diagnosis of diseases in humans that is more effective and efficient than methods currently employed by diagnostic centers. Currently, physicians write prescriptions for diagnostic tests in response to patient symptoms. Then, the patient presents the prescriptions to a medical facility to perform the diagnostic test.

Under the present system, physicians perform a clinical assessment based on the patient's symptoms, and the diagnosticians arrive at one or more provincial disease diagnosis. The system creates system tables, which are used by the medical facility to determine what diagnostic test is associated with confirmation of the disease. The medical facility performs the diagnostic test, and the presence of the disease is confirmed or denied. Examples of medical facilities include but are not limited to hospitals, outpatient diagnostic centers, and clinics.

The system applies quantitative analysis to the art of disease diagnosis, as the method for construction of nonparametric, retrospective, disease cohort, rank ordered, weighted concatenation tables, unique to a disease and specific to the medical center where they are created, with prospective application.

FIG. 1 is a flowchart showing an overview of an embodiment of system 50. As shown in FIG. 1, a medical facility's records are gathered and received as input in operation 100. In the preprocessing of operation 200, the medical records are manually, or digitally, sorted by Diagnostic Related Groups (DRGs) and diagnostic test values are recorded. DRGs are used to classify medical records cases into cohorts, with each cohort expected to have similar hospital resource use. Diagnostic test values may be one of three possible values: positive, negative, or equivocal. In the main processing of operation 300, DIAGNOSIMETRICAL™ transformations, explained in detail below, are applied to the medical record cohort specific DRGs. Then, in the output processing of operation 400, system values, also referred to as DIAGNOSIMETRIC™ values, are created and may then be used to generate system tables. System values (and/or the corresponding system tables) are stored in digital or hard copy format in operation 500. Then, in the diagnostic capacity temporal stabilizer stage (operation 600), the medical facility's diagnostic capacity is measured at a known date and time. Then, in operation 700, system values (and/or the corresponding system tables) are checked for quality control based on the diagnostic capacity.

FIG. 2 is a flowchart showing an overview of the quality control feedback loop in an embodiment of system 50, which includes the diagnostic capacity temporal stabilizer (operation 600) and the quality control stage (operation 700). In operation 600, a number of factors are checked to determine if a change has occurred that requires changes to the system values (and the corresponding system tables). These factors may include changes in diagnostic equipment, changes in diagnosticians, and changes in technology. Operation 600 is time sensitive. In operation 700, it is determined if the diagnostic capacity of the medical facility has changed. If a change has occurred as determined in operation 750, then the system returns to operation 200 so that the new information can be processed and included in the creation of updated system values. This quality control feedback loop dynamically customizes the system table results to the target facility.

In an embodiment, referring back to FIG. 1, system 50 begins by establishing a target group of patients to be analyzed for disease treatment results. Next, in operation 100, data from the group of target patients' medical records is input into the system database. At the time of input, the system database software assigns a unique "Patient Key" to each patient record in order to maintain medical privacy. The following is an exemplary list of data taken from each patient's medical records:

A. Hospital Demographics

1. Name
2. Type
3. Region
4. Number of beds

B. Patient Demographics

1. Case Number
2. Date of Birth
3. Religion
4. Insurance Type
5. Sex
6. Occupation (pre-retirement)
7. Tobacco use
8. Admission Date
9. Discharge Date
10. Ethnicity

C. Diagnostic Procedure Characteristics

1. DRG Number
2. DRG Name
3. DRG Modality
4. Diagnostic Test Name (where the Diagnostic Test is the first use of a test)
5. Diagnostic Test CPT
6. Diagnostic Test Result – Positive, Negative, or Equivocal
7. Physician Ordering the test
8. Physician Generating the test result
9. Evaluative Test Date (where the Evaluative Test is the second application of the same Diagnostic Test)
10. Evaluative Test Result – Positive, Negative, or Equivocal

Once the medical records have been received by system 50, the medical records are then sorted by DRGs in operation 200. The system database is scanned with the system analyzer in operation 300. The system analyzer works by creating and processing internal variables to track mathematical weighting ratios for the probabilities of a particular diagnostic test producing a desired diagnostic result.

To do this, the system analyzer generates a system value for each diagnostic test in the database. The system value (D_x) is conceptually based on an odds ratio given by $\frac{ad}{bc}$, where *a* is the number of patients with a positive test that have the disease in question (true positive), *b* is the number of patients with a positive test that do not have the disease in question (false positive), *c* is the number of patients with a negative test that have the disease in question (false negative), and *d* is the number of patients with a negative test that do not have the disease in question (true negative).

Specifically, the variables from the odds ratio are derived from a 2x2 contingency table as follows:

	True Positive (Patients with Disease)	True Negative (Patients without Disease)
Positive	a	b
Negative	c	d

The conceptual basis is modified, and the positive odds ratio given by $\frac{a}{c}$. The odds are 100% for confirmation of the disease in question.

It is also possible to develop system values through the complementary opposite of $\frac{a}{c}$, which is the negative odds ratio given by $\frac{b}{d}$. This negative odds ratio is 100% for confirmation of no disease being present. As such, $\frac{a}{c}$ represents the true positive values and $\frac{b}{d}$ represents the true negative values. The example below generates positive system values, or DIAGNOSIMETRIC™ values, D_p based on $\frac{a}{c}$. It is also possible to derive the same system value based on the use of $\frac{b}{d}$, which gives the negative system values D_n. Therefore, $D_p = D_n$ in so far as the system table generated is for disease confirmation D_p, and D_n is for disease absence. Therefore, D_p is the same system as D_n. There is a spectrum of permutation between D_p and D_n all of which are the same system, $D_p, D_n, \ldots D_x \ldots D_{nth}$. The use of D_p is illustrated below.

The system value D_p may be found by solving for

$$D_p = \frac{a}{c}$$

$$= [\mathrm{sign}]\left[abs\left(\log\left(X+\frac{1}{N}\right)\right)-\log(Y+N)\right]*(1-(N-T))*(X+T)$$

,

where *X* is the number of positive test results for a specific diagnostic test, *Y* is the number of negative test results for the specific diagnostic test, *T* is the total number of test results for the specific diagnostic test (positive, negative, and equivocal), and N is the sum total number of test results for all diagnostic tests performed for this DRG. The system value may also be divided by factors of 10 to produce numbers that are easier to read and analyze. For example, for a divisor of 10,000, the system value would be given as

$$\frac{[\mathrm{sign}]\left[abs\left(\log\left(X+\frac{1}{N}\right)\right)-\log(Y+N)\right]*(1-(N-T))*(X+T)}{10{,}000}.$$

Each of the components of the above formulas are defined as follows:

1. D_p is the composite weighted value given to each diagnostic test in the DRG cohort, and reflects the diagnostic test under investigation strength to identify a specific disease,

2. $\left(\log\left(X+\frac{1}{N}\right)\right)$ is a weighted (1/N=weight value) number sum of positive test values (X) the log of which inverses and moves the number (X + 1/N) to travel in the same Cartesian quadrant and in the same direction as Y,

3. $\log(Y+N)$ is a weighted (N=weight value) number sum of negative test values (Y) the log of which inverses and moves the number (Y+N) to travel in the same Cartesian quadrant and in the same direction as X,

4. abs insures the result difference number of $\left(\log\left(X+\frac{1}{N}\right)\right)-\log\left(Y+\frac{1}{N}\right)$ is a positive integer,

5. $(1-(N-T))$ is the weight value of occurrence of the diagnostic test under analysis,

6. $(X+T)$ is the weight value of positive strength of the diagnostic test under analysis, and

7. $[\mathrm{sign}]$ moves and inverts the periodic occurrence of the function $\left[abs\left(\log\left(X+\frac{1}{N}\right)\right)-\log(Y+N)\right]*(1-(N-T))*(X+T)$ to the first

quadrant of the Cartesian coordinate system, as illustrated in the graph shown in FIG. 3.

Alternatively, the system value may be found by solving for

$$[\text{sign}]\left[abs\left(\log\left(X+\frac{1}{N}\right)\right)-\log\left(Y+\frac{1}{N}\right)\right]\left(1-\frac{Z}{N}\right),$$

where Z is the number of patients not receiving the diagnostic test. The expression (1- $\frac{Z}{N}$) is equivalent to $(1-(N-T))*(X+T)$, and is an example of the algebraic manipulation of numbers. Ultimately, both expressions reveal the weighted strength of the diagnostic test in question to identify the presences, or absence of the disease under investigation.

Once the system values are calculated, system 50 then generates the system table (operation 400). The system table contains the recommended diagnostic tests to be run at the target facility per DRG-diagnosed disease. The system table is stored as a digital value or paper copy in operation 500. This results in the system table, which lists a number of diagnostic test procedures and the corresponding system value for a DRG disease treated by the target facility. Each DRG disease will have its own system table.

An example system table is shown in FIGS. 4A-4D. In this example, the results for syncope and collapse (DRG 312) at a medical facility are shown. At this particular medical facility, DRG 312 generated 144 medical records for a one year period. DRG 312 produced 2,732 diagnostic test results, which averages out to almost 20 diagnostic tests per medical record (case). The 2,732 diagnostic tests results split into 2,132 negative results, 482 positive results, 81 equivocal results, and 37 no-test-performed results, for a gross specificity of 0.18. The 2,732 test results came from 187 different types of diagnostic tests. In the example system table, the first column lists all of the diagnostic tests used at this facility on patients that were eventually diagnosed with syncope and collapse. The second, third, and fourth columns lists all the number of the negative test results, positive test results, and equivocal test results for each of the diagnostic tests, respectively. The fifth column lists the number of patients that were diagnosed with syncope and collapse that did not have any diagnostic test performed. The sixth column lists the total number of each patient having each diagnostic test and the last column lists the system value generated by system 50. The diagnostic test with the highest system value is listed first and the remaining diagnostic tests are listed by decreasing order of their system value. The higher the diagnostic test is on the list, the more likely the test is to appropriately identify the disease in question. In the example chart, a CPK (Creatine Phosphokinase) blood test is the diagnostic test most likely to appropriately identify syncope and collapse at this particular medical facility and the tests least likely to appropriately identify syncope and collapse at the facility are microalbumin, PETIC, and Uric Acid.

The subject medical facility can use this table to reduce drastically the number of diagnostic test performed at the facility. If a patient is thought to have syncope and collapse, the first two (or three) tests listed on the table may be performed. If these tests confirm the patient is free of the disease, then the diagnostician can move on to another potential diagnosis (and another system table for the new potential disease). The medical facility will not need to perform the other 185 (or 184) tests to confirm the presence of the disease, resulting in vast financial savings and a great improvement in the quality of medical care. Clinicians will be free from the burden of association of symptoms to diagnostic testing that proves time consuming and wasteful and physicians will have more time to focus on clinical evaluation and consultation to render a set of disease possibilities that the medical facility is expert to evaluate.

Based on existing medical physics evaluation record, a baseline value for each diagnostic instrument is obtained in operation 600. This baseline value is applied to future system evaluation, and is applied to existing values over time. The effect is to insure that changes in the medical facility's diagnostic capacity are reflected in the system value. Note that the diagnostic capacity is a measure of a medical facility's ability to diagnosis a disease. If the baseline value changes, a resort of the preprocessing occurs. Also note that diagnostic capacity is measured as follows:

Identify the baseline:	0 value = no change; 1 value = change
Diagnostic physicians:	0 value = no change; 1 value = change
Technology:	0 value = no change; 1 value = change
Diagnostic Equipment:	0 value = no change; 1 value = change

System table values and diagnostic capacity are then checked for stability and accuracy in operation 700. If both parameters are yes values, the system value is considered constant; if not, the table values are not constant, and a reevaluation is required.

It will be seen, that the advantages set forth above, and those made apparent from the foregoing description, are efficiently attained, and since certain changes may be made in the above construction without departing from the scope of the invention, it is intended that all matters contained in the foregoing description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention, which, as a matter of language, might be said to fall there between.

What is claimed is:

1. A method of determining the suitability of a diagnostic test for confirmation of a disease in humans comprising:

obtaining disease treatment results for a plurality of patients grouped by disease in a Diagnostic Related Group (DRG);

obtaining a plurality of diagnostic tests corresponding to each patient, each diagnostic test having a test result selected from the group comprising a positive result, a negative result, and an equivocal result;

retrieving a first result for a first diagnostic test performed for each of the plurality of patients;

retrieving a second result for a second diagnostic test performed for each of the plurality of patients; and

transforming the first and second results to create a system value by solving for

$$[\text{sign}]\left[abs\left(\log\left(X+\frac{1}{N}\right)\right)-\log(Y+N)\right]*(1-(N-T))*(X+T)$$

, where X is the number of positive results for the first diagnostic test, Y is the number of negative results for the first diagnostic test, T is the total number of positive results, negative results, and equivocal results for the first diagnostic test, and N is the total number of positive results, negative results, and equivocal results for the first diagnostic test and positive results, negative results, and equivocal results for the second diagnostic test, wherein the system value represents the suitability of the diagnostic test for confirmation of the disease.

2. The method of claim 1, further comprising:

generating a system table using the system value;

performing a clinical assessment based on a persons' symptoms;

determining a provincial disease diagnosis based on the clinical assessment;

determining the best diagnostic test for the determined provincial disease diagnosis using the system table;

performing the diagnostic test; and

confirming or denying the presence of the disease based on the results of the diagnostic test.

3. The method of claim 2, wherein the plurality of patients are from a single medical facility.

4. The method of claim 3, further comprising:

measuring the medical facility's diagnostic capacity at a first time;

measuring the medical facility's diagnostic capacity at a second time;

determining if a relevant change has occurred in the facility's diagnostic capacity between the measurement at the first time and the measurement at the second time;

analyzing the system value or the system table for quality control based on the diagnostic capacity of the medical facility; and

re-calculating the system value, responsive to a change in the diagnostic capacity of the medical facility.

5. The method of claim 4, wherein the relevant change is one or more of the changes chosen from the group consisting of a change in equipment, a change in diagnosticians, and a change in technology.

6. The method of claim 1, further comprising:

determining a baseline value for a diagnostic instrument based on existing a medical physics evaluation record; and

updating the system value responsive to a change in the baseline value.

7. A computer system adapted to determine the suitability of a diagnostic test for confirmation of a disease in humans comprising:

a processor; and

a tangible memory storage including software instructions that cause the computer system to perform:

1. obtaining disease treatment results for a plurality of patients grouped by disease in a Diagnostic Related Group (DRG),

2. obtaining a plurality of diagnostic tests corresponding to each patient, each diagnostic test having a test result selected from the group comprising a positive result, a negative result, and an equivocal result,

3. retrieving a first result for a first diagnostic test performed for each of the plurality of patients,

4. retrieving a second result for a second diagnostic test performed for each of the plurality of patients, and

5. transforming the first and second results to create a system value by solving for $[\text{sign}]\left[abs\left(\log\left(X+\frac{1}{N}\right)\right)-\log(Y+N)\right]*(1-(N-T))*(X+T)$, where X is the number of positive results for the first diagnostic test, Y is the number of negative results for the first diagnostic test, T is the total number of positive results, negative results, and equivocal results for the first diagnostic test, and N is the total number of positive results, negative results, and equivocal results for the first diagnostic test and positive results, negative results, and equivocal results for the second diagnostic test, wherein the system value represents the suitability of the diagnostic test for confirmation of the disease,

whereby the computer determines the suitability of a diagnostic test for confirmation of a disease in humans.

8. The computer system of claim 7, wherein the tangible memory storage further includes software instructions that cause the computer system to perform:

generating a system table using the system value.

9. The computer system of claim 8, wherein the plurality of patients are from a single medical facility.

10. The computer system of claim 9, wherein the tangible memory storage further includes software instructions that cause the computer system to perform:

measuring the medical facility's diagnostic capacity at a first time,

measuring the medical facility's diagnostic capacity at a second time,

determining if a relevant change has occurred in the facility's diagnostic capacity between the measurement at the first time and the measurement at the second time,

analyzing the system value or the system table for quality control based on the diagnostic capacity of the medical facility, and

re-calculating the system value, responsive to a change in the diagnostic capacity of the medical facility.

11. The computer system of claim 10, wherein the relevant change is one or more of the changes chosen from the group consisting of a change in equipment, a change in diagnosticians, and a change in technology.

12. The computer system of claim 7, wherein the tangible memory storage further includes software instructions that cause the computer system to perform::

determining a baseline value for a diagnostic instrument based on existing a medical physics evaluation record, and

updating the system value responsive to a change in the baseline value.

13. A method of diagnosing disease in humans comprising:

obtaining disease treatment results for a plurality of patients grouped by disease in a Diagnostic Related Group (DRG);

obtaining a plurality of diagnostic tests corresponding to each patient, each diagnostic test having a test result selected from the group comprising a positive result, a negative result, and an equivocal result;

retrieving a first result for a first diagnostic test performed for each of the plurality of patients;

retrieving a second result for a second diagnostic test performed for each of the plurality of patients; and

transforming the first and second results to create a system value by solving for $[\mathrm{sign}]\left[abs\left(\log\left(X+\frac{1}{N}\right)\right)-\log\left(Y+\frac{1}{N}\right)\right]\left(1-\frac{Z}{N}\right)$, where X is the number of positive results for the first diagnostic test, Y is the number of negative results for the first diagnostic test, T is the total number of positive results, negative results, and equivocal results for the first diagnostic test, N is the total number of positive results, negative results, and equivocal results for the first diagnostic test and positive results, negative results, and equivocal results for the second diagnostic test, and Z is the number of patients not receiving the diagnostic test, wherein the system value represents the suitability of the diagnostic test for confirmation of the disease.

14. The method of claim 13, further comprising:

generating a system table using the system value;

performing a clinical assessment based on a persons' symptoms;

determining a provincial disease diagnosis based on the clinical assessment;

determining the best diagnostic test for the determined provincial disease diagnosis using the system table;

performing the diagnostic test; and

confirming or denying the presence of the disease based on the results of the diagnostic test.

15. The method of claim 14, wherein the plurality of patients are from a single medical facility.

16. The method of claim 15, further comprising:

measuring the medical facility's diagnostic capacity at a first time;

measuring the medical facility's diagnostic capacity at a second time;

determining if a relevant change has occurred in the facility's diagnostic capacity between the measurement at the first time and the measurement at the second time;

analyzing the system value or the system table for quality control based on the diagnostic capacity of the medical facility; and

re-calculating the system value, responsive to a change in the diagnostic capacity of the medical facility.

17. The method of claim 16, wherein the relevant change is one or more of the changes chosen from the group consisting of a change in equipment, a change in diagnosticians, and a change in technology.

18. The method of claim 13, further comprising:

determining a baseline value for a diagnostic instrument based on existing a medical physics evaluation record; and

updating the system value responsive to a change in the baseline value.

19. A computer system adapted to determine the suitability of a diagnostic test for confirmation of a disease in humans comprising:

a processor; and

a tangible memory storage including software instructions that cause the computer system to perform:

1. obtaining disease treatment results for a plurality of patients grouped by disease in a Diagnostic Related Group (DRG),

2. obtaining a plurality of diagnostic tests corresponding to each patient, each diagnostic test having a test result selected from the group comprising a positive result, a negative result, and an equivocal result,

3. retrieving a first result for a first diagnostic test performed for each of the plurality of patients,

4. retrieving a second result for a second diagnostic test performed for each of the plurality of patients, and

5. transforming the first and second results to create a system value by solving for $[\text{sign}]\left[abs\left(\log\left(X+\frac{1}{N}\right)\right)-\log\left(Y+\frac{1}{N}\right)\right]\left(1-\frac{Z}{N}\right)$, where X is the number of positive results for the first diagnostic test, Y is the number of negative results for the first diagnostic test, T is the total number of positive results, negative results, and equivocal results for the first diagnostic test, N is the total number of positive results, negative results, and equivocal results for the first diagnostic test and positive results, negative results, and equivocal results for the second diagnostic test, and Z is the number of patients not receiving the diagnostic test, wherein the system value represents the suitability of the diagnostic test for confirmation of the disease.

whereby the computer determines the suitability of a diagnostic test for confirmation of a disease in humans.

20. The computer system of claim 19, wherein the tangible memory storage further includes software instructions that cause the computer system to perform:

generating a system table using the system value.

21. The computer system of claim 20, wherein the plurality of patients are from a single medical facility.

22. The computer system of claim 21, wherein the tangible memory storage further includes software instructions that cause the computer system to perform:

measuring the medical facility's diagnostic capacity at a first time,

measuring the medical facility's diagnostic capacity at a second time,

determining if a relevant change has occurred in the facility's diagnostic capacity between the measurement at the first time and the measurement at the second time,

analyzing the system value or the system table for quality control based on the diagnostic capacity of the medical facility, and re-calculating the system value, responsive to a change in the diagnostic capacity of the medical facility.

23. The computer system of claim 22, wherein the relevant change is one or more of the changes chosen from the group consisting of a change in equipment, a change in diagnosticians, and a change in technology.

24. The computer system of claim 20, wherein the tangible memory storage further includes software instructions that cause the computer system to perform::

determining a baseline value for a diagnostic instrument based on existing a medical physics evaluation record, and

updating the system value responsive to a change in the baseline value.

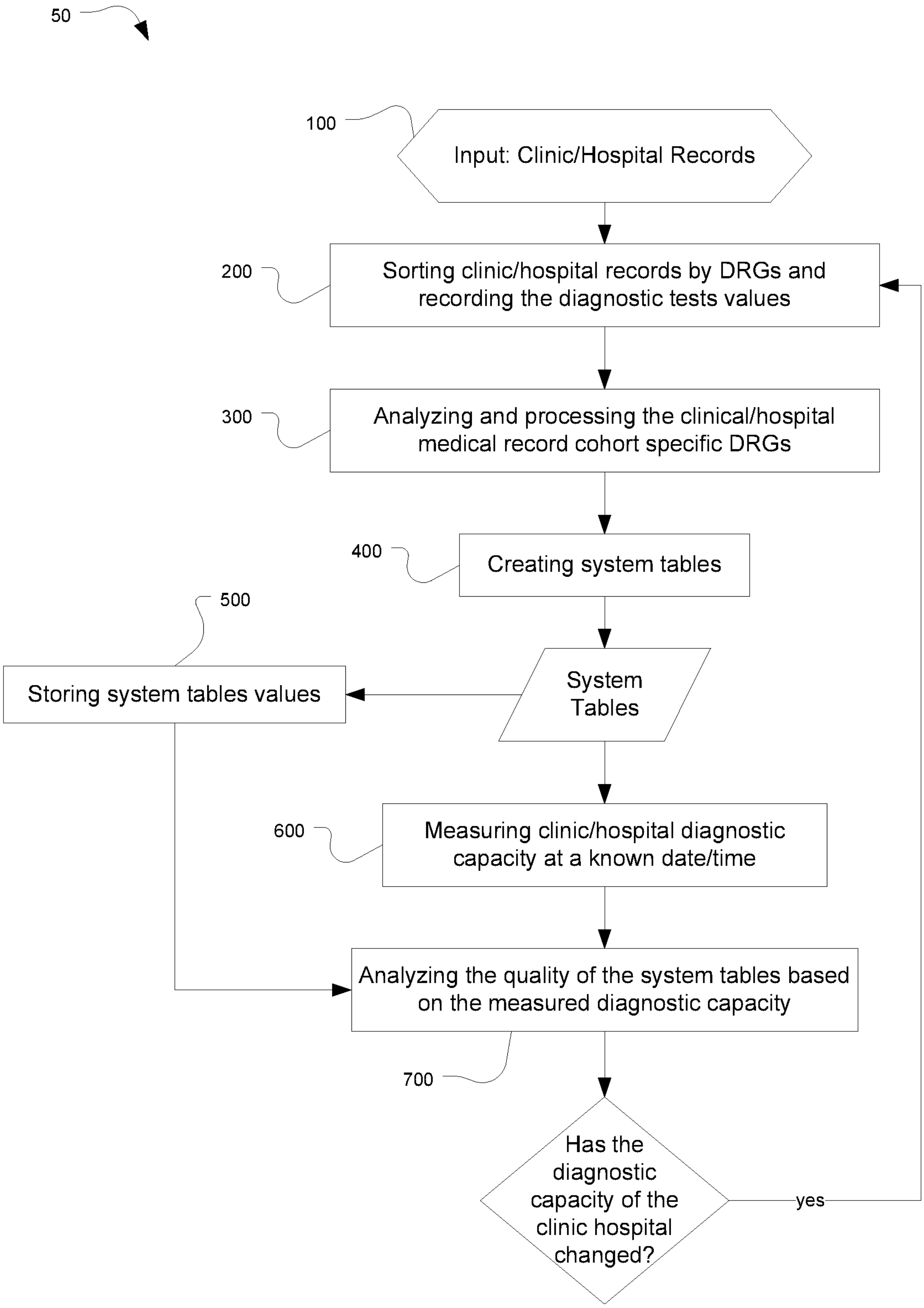
50
100
Input: Clinic/Hospital Records
200
Sorting clinic/hospital records by DRGs and recording the diagnostic tests values
300
Analyzing and processing the clinical/hospital medical record cohort specific DRGs
400
Creating system tables
500
Storing system tables values
System Tables
600
Measuring clinic/hospital diagnostic capacity at a known date/time
Analyzing the quality of the system tables based on the measured diagnostic capacity
700
Has the diagnostic capacity of the clinic hospital changed?
yes

FIG. 1

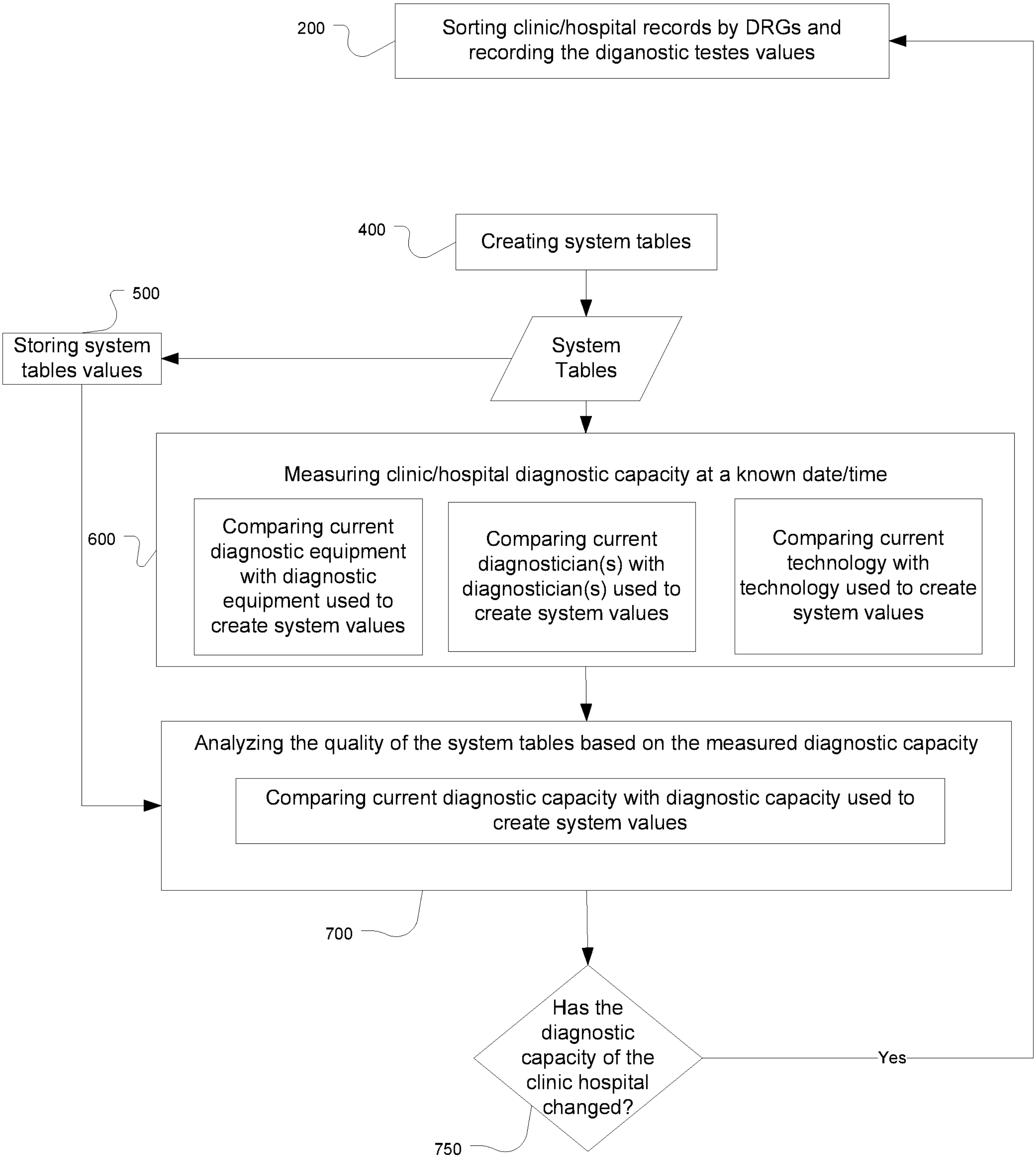
200
Sorting clinic/hospital records by DRGs and recording the diganostic testes values
400
Creating system tables
500
Storing system tables values
System Tables
600
Measuring clinic/hospital diagnostic capacity at a known date/time
Comparing current diagnostic equipment with diagnostic equipment used to create system values
Comparing current diagnostician(s) with diagnostician(s) used to create system values
Comparing current technology with technology used to create system values
Analyzing the quality of the system tables based on the measured diagnostic capacity
Comparing current diagnostic capacity with diagnostic capacity used to create system values
700
Has the diagnostic capacity of the clinic hospital changed?
Yes
750

FIG. 2

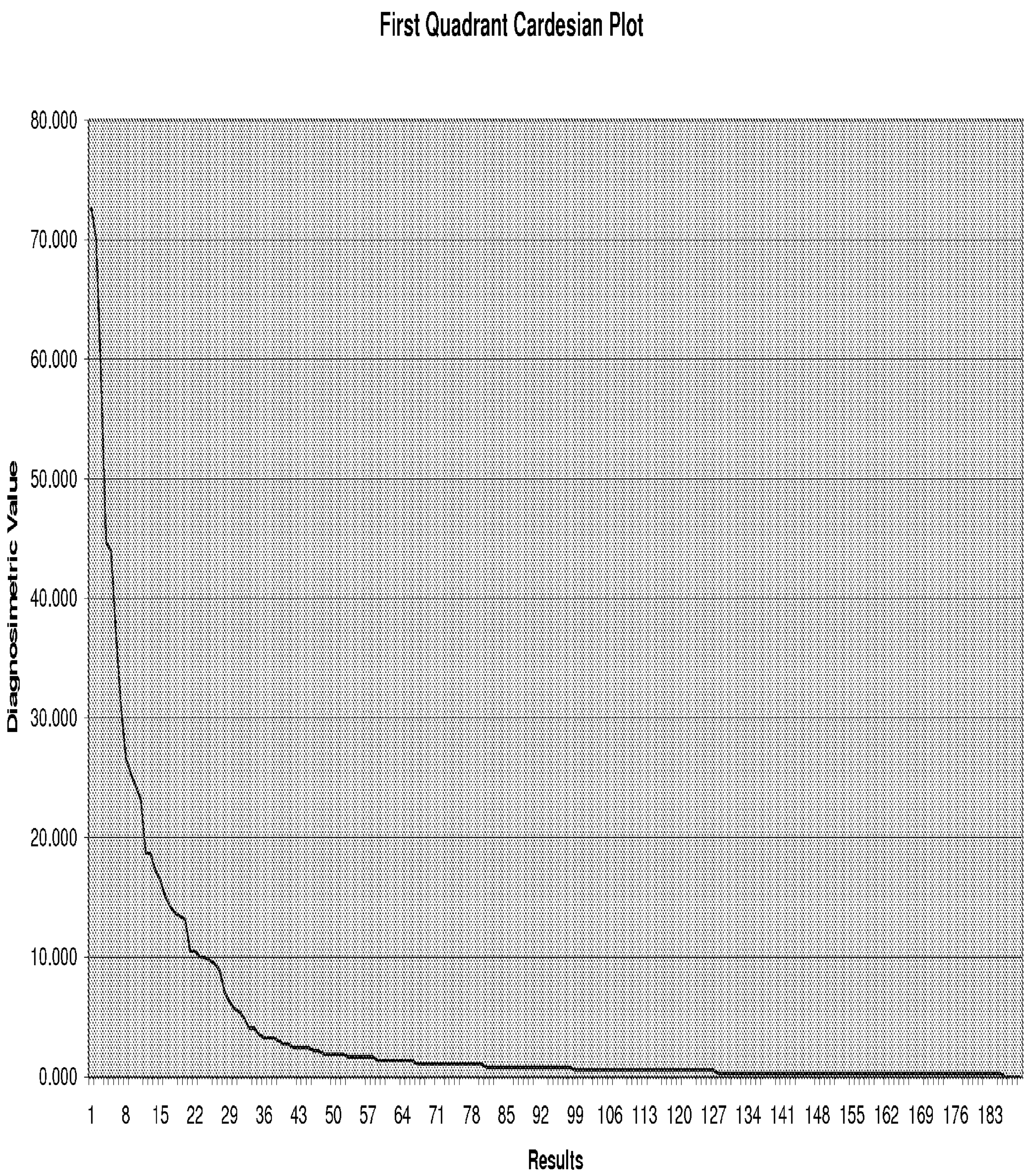
First Quadrant Cardesian Plot
Diagnosimetric Value
80.000
70.000
60.000
50.000
40.000
30.000
20.000
10.000
0.000
1 8 15 22 29 36 43 50 57 64 71 78 85 92 99 106 113 120 127 134 141 148 155 162 169 176 183
Results

FIG. 3

Illness Specific Diagnostic Table
Syncope & Collapse - DRG 312

Diagnostic Test	Negative	Positive	Equivocal	None	Total	Diagnosimetric Value
CPK	235	26	8		269	72.629
CKMB	262	11	1		274	70.025
Troponin	187	20	4		211	58.212
CBC	58	52	9		119	44.665
CMP	55	54	5		114	43.966
Glu-POC	53	31	26		110	36.956
BMP	63	24	7		94	31.117
PT	83	9			92	26.654
PTT	82	7			89	25.363
Magnesium	80	6			86	24.334
TROP	41	23			64	23.203
CBC/Diff	42	14			56	18.725
TSH	60	5			65	18.662
Echo	22	21			43	17.203
BNP	24	18	1		43	16.397
CT Brain	38	9			47	15.030
Folate	37	8			45	14.236
Lipid	43	4			47	13.688
Chest	46	2			48	13.415
UA	36	4	5		45	13.161
US Echocardiogram	29	5			34	10.518
CT Brain w/o	37	1			38	10.503
GW POC	1	18			19	10.034
B12	35	1			36	9.972
US Cartoid Duplex	26	5			31	9.720
Carotid US	23	6			29	9.457
X-Ray Chest 1 view	31	1			32	8.907
T4 Free	20	3			23	7.041
GLU POC	7	8			15	6.247
D Dimer	13	4			17	5.699
Brain	8	6			14	5.434
Phosphorous	12	3			15	4.889
URINALYSIS	13	1			14	4.076
Culture-Blood	15				15	4.074
T4 Total	11	1			12	3.535
HSH (HCT)		6			6	3.270
HSH (HGB)		6			6	3.270
VIT B12	12				12	3.263
ABG	1	5			6	2.998
Digoxin	4	3			7	2.724
XR CHEST	10				10	2.721
Drug Screen	1	4			5	2.453
GW POCH	1	4			5	2.453
H&H	3	3			6	2.453
MR Brain w/ wo cont.	7	1			8	2.451
SED RATE	3	1	3		7	2.179
AMYLASE	8				8	2.178
CRP	1	3			4	1.909
MRA BRAIN	3	2			5	1.908
BLOOD CULTURE	7				7	1.907
Culture-Urine	5		2		7	1.907
LIPID PF	7				7	1.907
MR Angio Neck w/o	2	2			4	1.636
Alcohol	4	1			5	1.636
Hgb A,C	3	1	1		5	1.636
Neck	4	1			5	1.636

FIG. 4A

Diagnostic Test	Negative	Positive	Equivocal	None	Total	Diagnosimetric Test Value
LIPASE	6				6	1.635
T3 Total	6				6	1.635
DRUG URINE	1	2			3	1.364
D. DIMER	3	1			4	1.364
MRA NECK	3	1			4	1.364
US CAROTID	3	1			4	1.364
CK	5				5	1.363
CT Abdomen	5				5	1.363
CT Chest	5				5	1.363
Liver	5				5	1.363
AIC		2			2	1.092
C URINE		2			2	1.092
DRUG SERUM		2			2	1.092
UF		2			2	1.092
URINE CULTURE		2			2	1.092
Hg A,C	2	1			3	1.091
MRA Head woC	2	1			3	1.091
CBK	4				4	1.091
CT Pelvis	4				4	1.091
MR BRAIN	4				4	1.091
OCCULT BLD	4				4	1.091
T3 Free	4				4	1.091
T3 Uptake	4				4	1.091
XR Chest 2V	4				4	1.091
URINE DRUG SCREEN	1	1			2	0.819
ANA	3				3	0.818
CRMB	3				3	0.818
CT Chest PE w C	3				3	0.818
DILANTIN	3				3	0.818
Hb A,C	2		1		3	0.818
HEMOGLOBIN A1C	3				3	0.818
LDH	3				3	0.818
LIVER FX	3				3	0.818
MR Angio Neck	3				3	0.818
MRA Head wo cont	3				3	0.818
NM Myocardial SPECT MH	3				3	0.818
PSA	3				3	0.818
PT/INR	3				3	0.818
T3U	3				3	0.818
T4	3				3	0.818
US Ext Lower Venous Doppler Bil	3				3	0.818
XR L-Spine 4V	3				3	0.818
ALCASTERNE		1			1	0.546
ARC		1			1	0.546
B. DIMER		1			1	0.546
Cerebral Angiogram		1			1	0.546
CT C-spine		1			1	0.546
CUTTER URINE		1			1	0.546
Homocystine		1			1	0.546
IFE SERUM		1			1	0.546
Protein EP		1			1	0.546
US CAROTID		1			1	0.546
C BC	2				2	0.546
C Diff	2				2	0.546
Cortisol	1		1		2	0.546
CT Abd	2				2	0.546
CT Abd w/wo C	2				2	0.546
CT C-Spine woc	2				2	0.546
ESR	2				2	0.546
HCG Qual	2				2	0.546
MG	2				2	0.546

FIG. 4B

Diagnostic Test	Negative	Positive	Equivocal	None	Total	Diagnosimetric Test Value
MR Brain w/o cont	2				2	0.546
O&P	2				2	0.546
Occutt Bld	1		1		2	0.546
RA QUAL	2				2	0.546
Stool CX	1		1		2	0.546
Venous	2				2	0.546
Venous lower ext	2				2	0.546
WBC Stool	2				2	0.546
XR ABD, F/Upr	2				2	0.546
XR Ribs	2				2	0.546
Abdomen US	1				1	0.273
Acetaminophen	1				1	0.273
Aldosterone	1				1	0.273
Ammonia	1				1	0.273
Arterial US	1				1	0.273
Bone	1				1	0.273
CATECHOLAMINES, FRACTIONATED	1				1	0.273
CT AND W/O	1				1	0.273
CT Chest woc	1				1	0.273
CT HEAD W/O	1				1	0.273
CT Head wo cont	1				1	0.273
CT Head/Brain	1				1	0.273
CT PELVIS W	1				1	0.273
CT Pelvis wc	1				1	0.273
CTA Chest w/wo cont	1				1	0.273
Digotin	1				1	0.273
Drs Triage	1				1	0.273
Foot	1				1	0.273
HCG U Qual	1				1	0.273
HCG URINE	1				1	0.273
Head	1				1	0.273
Humerus	1				1	0.273
Knee	1				1	0.273
LIPAISE	1				1	0.273
Lower Ext US	1				1	0.273
MR Angio Head	1				1	0.273
MR Brain w/o	1				1	0.273
MR C-Spine wo	1				1	0.273
MRI BRAIN	1				1	0.273
NM Scan	1				1	0.273
PE Chest	1				1	0.273
PENIN	1				1	0.273
Prealbumin	1				1	0.273
PT	1				1	0.273
Renin	1				1	0.273
Ribs	1				1	0.273
Salicylate	1				1	0.273
Shoulder	1				1	0.273
U Microalbumin	1				1	0.273
URD	1				1	0.273
URINE EOSINOPHIS	1				1	0.273
Urine-Chloride	1				1	0.273
Urine-Creatinine	1				1	0.273
Urine-Potassium	1				1	0.273
Urine-Sodium	1				1	0.273
US ABD	1				1	0.273
US Abdomen Complete	1				1	0.273
US CAROTID	1				1	0.273
US CAROTID DUPLEX	1				1	0.273
US Cartoid	1				1	0.273
US ECHO	1				1	0.273

FIG. 4C

Diagnostic Test	Negative	Positive	Equivocal	None	Total	Diagnosimetric Test Value
US Ext Lower Venous Duplex Bil	1				1	0.273
US EXT LOWR	1				1	0.273
US Thyroid	1				1	0.273
VOLTAGE- GALED CALCIUM	1				1	0.273
XR C-Spine 4V	1				1	0.273
XR Elbow	1				1	0.273
XR Wrist	1				1	0.273
Microalbumin			1		1	0.000
None				37	37	0.000
PETIC			2		2	0.000
URIC ACID			2		2	0.000
Grand Total	**2132**	**482**	**81**	**37**	**2732**	

FIG. 4D