

Claims

1. A computerized method for detecting stroke, identifying type of stroke, identifying and quantifying any ischemic and hemorrhagic lesions, and obtaining a predictive value characterizing a prognosis for a patient who has suffered a stroke, the method comprising:

(a) receiving a CT scan of a brain region of the subject;

(b) pre-processing the image to identify the portion of it corresponding to the brain, ~~and to obtain brain landmarks;~~

(c) identifying if the CT scan contains a hemorrhage, and if the determination is positive obtaining location data characterizing the location and volume of the hemorrhage,

(d) identifying if the CT scan contains an infarct, and if the determination is positive obtaining location data characterizing the location and volume of the infarct;

(e) analyzing the location data using a brain atlas ~~and the brain landmarks;~~ and

(f) obtaining at least one predictive value using the results of the analysis of the location data.

2. A method according to claim 1 in which the said pre-processing step includes obtaining brain landmarks, and the said step of analyzing the location data uses the brain landmarks.

32. A method according to claim 1 or claim 2 further including:

obtaining a ratio indicative of the volume of the hemorrhage compared to the infarct, the ratio being used in step (f).

5 | 43. A method according to claim 1, claim 2 or claim 32 in which step (b) includes extracting the brain from the image.

| 54. A method according to claim 1, claim 2, claim 3 or claim 43 in which step (b) includes obtaining a mid-sagittal plane for the image.

10 | 65. A method according to any preceding claim in which step (b) includes segmenting ventricles in the brain image.

| 76. A method according to any preceding claim in which step (c) includes characterizing the type of hemorrhage.

15 | 87. A method according to claim 76 when dependent upon claim 54, in which the step of characterizing the type of hemorrhage comprises determining the position of the hemorrhage in relation to the mid-sagittal plane, and identifying the hemorrhage as a subarachnoid hemorrhage SAH or subdural hemorrhage SDH
20 | according to the proximity of the hemorrhage to the brain or mid-sagittal plane.

| 98. A method according to claim 76 or claim 87 when dependent on claim-~~5~~ 6, in which the step of characterizing the type of hemorrhage comprises determining the proximity of the hemorrhage to the segmented ventricles, and identifying the
25 | hemorrhage as an intra-ventricular hemorrhage (IVH) according to the proximity.

109. A method according to any preceding claim in which step (a) additionally comprises receiving at least one perfusion scan (CTP) scan of the brain of the subject and/or at least one angiography (CTA) scan of the brain of the subject, and step (d) further comprises analyzing said CTP and/or CTA scan.

110. A method according to any preceding claim in which step (e) includes obtaining neuro-anatomy and blood supply territory information from the brain atlas, said neuro-anatomy and blood supply territory information being used in step (f).

124. A method according to any preceding claim in which step (f) is performed using a probabilistic stroke atlas, which associates locations of the brain with values of the predictive parameter, the probabilistic stroke atlas having been generated from data relating to other individuals than the subject.

132. A computer system having a processor and a data storage device, the data storage device storing program instructions for implementation by the processor to cause the computer system to perform a method according to any of the proceeding claims in which the processor performs steps (b)-(f).

143. A computer program product such as a tangible data storage device, storing program instructions for implementation by a processor of a computer system to cause the computer system to perform a method according to any of claims 1 to 124 in which the processor performs steps (b)-(f).

154. A method of selecting a treatment for a subject who suffers from a stroke, comprising performing a method according to any of claims 1 to 124, and selecting a treatment for the patient using the predictive value.

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165. A method of treating a subject who suffers from a stroke, comprising performing a method according to any of claims 1 to 154 to select a treatment, and performing the treatment.