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COMPUTER APPARATUS FOR IMAGE CREATION AND ANALYSIS

ALLOWED CLAIMS

8. (Amended) A computer apparatus comprising:

(a) a non-transitory_memory configured to receive one or more medical diagnostic images;

(b) a program stored in the non-transitory_memory and operatively configured to detect and label at least one spinal structure in said medical diagnostic images; and

(c) a computer processor in communication with the non-transitory_memory and configured to perform the program by executing computer executable instructions, wherein the program is operatively configured to automatically generate a prescription using said labeling.

9. (Amended) The apparatus of Claim 8 wherein said labeling is used to label similar structures in additional medical diagnostic images of the same individual.

10. (Amended) The apparatus of Claim 8 wherein said labeling is used to guide a therapeutic procedure.

11. (Amended) The apparatus of Claim 8 wherein said labeling is used in the segmentation of one or more spinal structures.

12. (Amended) The apparatus of Claim 8 wherein the program is further operatively configured to make quantitative measurements related to labeled structures or their relationships to each other.

13. (Amended) The apparatus of Claim 8 wherein said labeling is used to assess for possible abnormalities.

14. (Amended) The apparatus of Claim 8 wherein the medical diagnostic images are obtained at least in part from a picture archiving system

15. (Amended) The apparatus of Claim 8 wherein said labeling is used to compare similarly labeled structures in a plurality of medical diagnostic images of the same individual.

16. (Amended) The apparatus of Claim 8 wherein said labeling uses the C1-C7, T1-T12, L1-L5 and S1-S5 convention.

17. (Amended) The apparatus of claim 8, wherein the prescription is to prescribe image reformations.

29. (Amended) An apparatus for accurately labeling spinal related structures even in the presence of anatomic variation, comprising:

(a) one or more computer processors;

(b) a non-transitory memory configured to receive medical diagnostic images;

(c) a program comprising computer executable instructions stored in the non-transitory memory that upon being executed by the one or more computer processors performs a method comprising:

providing a set of one or more medical diagnostic images for a particular individual, wherein at least one of the medical diagnostic images includes a plurality of non-cervical spinal-related structures to be labeled;

identifying a uniquely identifiable high cervical structure cranial to the C4 vertebra in the set of one or more medical diagnostic images; and

deriving a label for the plurality of non-cervical spinal-related structures in the at least one medical diagnostic images based at least in part on the identified unique high cervical structure.

31. (Amended) The apparatus of claim 29, wherein the unique high cervical structure includes the C1 vertebra or the C2 vertebra.

32. (Amended) The apparatus of claim 29, wherein the unique high cervical structure includes the C2-C3 inter-vertebral disc or the C3 vertebra.

33. (Amended) The apparatus of claim 29, wherein the method further comprises identifying a chain of structures extending from the high cervical structure to the plurality of non-cervical structures.

34. (Amended) The apparatus of claim 33, wherein the chain of structures includes one or more intervertebral discs, one or more vertebrae, one or more spine related structures identified in a cranial caudal direction, the spinal canal, the spinal cord, the skin surface, or a combination thereof.

35. (Amended) The apparatus of claim 29, wherein the method further comprises identifying a second structure selected from the spinal cord, spinal canal, skin surface, or combination thereof.

36. (Amended) The apparatus of claim 29, wherein the method further comprises identifying one or more structures in the set of one or more images using fat-water decomposition.

37. (Amended) The apparatus of claim 29, wherein the at least one medical diagnostic image includes a midline sagittal image generated from volumetric imaging data.

38. (Amended) The apparatus of claim 37, wherein the midline sagittal image includes a curved oblique reference to the spinal axis along the spine's plane of symmetry.

39. (Amended) The apparatus of claim 29, further comprising identifying an abnormality in non-cervical spinal-related structures.

40. (Amended) The apparatus of claim 29, wherein the non-cervical spinal-related structures include one or more thoracic vertebra, one or more thoracic inter-vertebral discs, or a combination thereof.

41. (Amended) The apparatus of claim 29, wherein the non-cervical spinal-related structures include one or more lumbar vertebrae, one or more lumbar inter-vertebral discs, or a combination thereof.

42. (Amended) The apparatus of claim 29, wherein the non-cervical spinal-related structures include one or more ribs, the sacrum, or a combination thereof.

43. (Amended) The apparatus of Claim 29 wherein the set of one or more images includes at least two images, the first image including the high cervical structure and the second image including the non-cervical spinal-related structures.

44. (Amended) The apparatus of Claim 29 wherein the labeling is used to compare corresponding structures between two or more images in the set of one or more diagnostic images.

45. (Amended) The apparatus of Claim 29 wherein the labeling is used to guide a therapeutic procedure.

46. (Amended) The apparatus of Claim 29 wherein the labeling is used in the segmentation of the plurality of spinal-related structures.

47. (Amended) The apparatus of Claim 29 wherein the program is further operatively configured to make quantitative measurements related to labeled non-cervical spinal-related structures or their relationships to each other.

48. (Amended) The apparatus of Claim 29 wherein the first medical diagnostic image is obtained at least in part from a picture archiving system.

49. (Amended) The apparatus of claim 29, where the plurality of spinal-related structures are iteratively detected and labeled in a cranial to caudal manner.

50. (Amended) The apparatus of claim 29 wherein the program is operatively configured to provide a diagnostic report.

51. (Amended) The apparatus of claim 29, wherein the identification of the plurality of spinal-related structures uses a detection algorithm that is constrained in part on information available in a DICOM header.

52. (Amended) The apparatus of claim 51, wherein said information available in the DICOM header includes one or more of the following factors: an individual's age, an individual's gender, an individual's weight, or a combination of the foregoing.