CLAIMS:

1. A method for diagnosing reflux disease in an individual, the method comprising:

(A) administering an oral dose of tracer in 75mL to 200 mL of water to the individual;

(B) capturing, with a single photon emission computed tomography (SPECT) scanner, data representative of multiple image frames of the individual in areas of interest that include the pharynx and oesophagus, wherein the data representative of multiple image frames are captured overtime after administration of the oral dose; and

(C) determining one or more trend(s) in tracer activity over time in the areas of interest based on the data representative of multiple image frames, wherein each image frame has a sampling time of greater than 5 seconds and less than or equal to 60 seconds, wherein the trend(s) in tracer activity overtime is indicative of a reflux disease.

2. A method according to claim 1 wherein the tracer includes technetium phytates in the range of 60 to 100 MBq.

3. A method according to claim 1 or 2, wherein the individual is administered an oral dose of Proton Pump Inhibitors (PPI) before the administration of the oral dose of tracer.

4. A method according to claim 3 wherein the oral dose of PPI is administered between 30 to 90 minutes before administering the oral dose of tracer.

5. A method according to any one of claims 1 to 4 further comprising determining a frequency of the trend in tracer activity in the pharynx that is above a specified threshold or in a specified range, wherein a higher frequency is indicative of intermittent laryngopharyngeal reflux and a lower frequency, or single occurrence, is indicative of continuous laryngopharyngeal reflux.

6. A method according to claim 5 wherein a frequency indicative of intermediate laryngopharyngeal reflux is indicative of an increased probability of lung aspiration of refluxate.

7. A method according to claim 5 or 6 further comprising:

capturing, with an oxygen saturation sensor, an oxygen saturation of the blood of the individual over time, wherein a decreasing trend in oxygen saturation and an indication of intermittent laryngopharyngeal reflux is indicative of a reflex mediated laryngopharyngeal spasm.

8. A method according to any one of claims 1 to 7 further comprising determining an amplitude and/or time of the trend in tracer activity in the pharynx that is above a second specified threshold, wherein the amplitude and/or time is indicative of a severity of laryngopharyngeal reflux.

9. A method according to any one of claims 1 to 8 wherein an ascending or flat trend in tracer activity over time in the oesophagus is indicative of the tracer in the oesophagus and significant gastroesophageal reflux.

10. A method according to any one of claims 1 to 9 wherein an ascending-trend in tracer activity over time in the pharynx is indicative of aspiration of the tracer and laryngopharyngeal reflux.

11. A method according to any one of claim 1 to 10 wherein at least part of the data representative of multiple image frames are captured over a first time period that is up to between 5 and 30 minutes after administration of the oral dose and with the individual in the upright position.

12. A method according to any one of claims 1 to 11 wherein at least part of the data representative of multiple image frames are captured over a second time period that occurs up to 30 minutes after administration of the oral dose and with the individual in the supine position.

13. A method according to any one of claims 1 to 12 wherein at least part of the data representative of multiple image frames are captured over a third time period that occurs between 90 minutes to 150 minutes after administration of the oral dose and with the individual in the supine position.

14. A method according to any one of claims 1 to 13 wherein the sampling time for each image frame is in the range of 15 to 30 seconds.

15. A method according to any one of claims 1 to 14 wherein the areas of interest includes the stomach of the individual, wherein the method further comprises:

- determining a trend in tracer activity by exponential fit of tracer activity in the stomach over time; and

- determining a time to half clearance of gastric liquid based on the exponential fit of tracer activity,

wherein a time to half clearance greater than 16 minutes is indicative of an individual as having a prolonged liquid gastric emptying.

16. A method according to any one of claims 1 to 15 wherein the SPECT scanner is a SPECT/CT scanner that further includes x-ray computed tomography (CT) to provide data representative of multiple image frames of the individual that includes details of anatomical features of the individual.

17. A system for diagnosing reflux disease in an individual, wherein the individual is administered an oral dose of tracer in 75mL to 200 mL of water, the system comprising:

- a single photon emission computed tomography (SPECT) scanner to capture data representative of multiple image frames of the individual in areas of interest that include the pharynx and oesophagus, wherein the data representative of multiple image frames are captured over time after administration of the oral dose;

- a processing device configured to:

- determine one or more trend(s) in tracer activity over time in the areas of interest based on the multiple image frames of the individual in the areas of interest over time, wherein each image frame has a sampling time of greater than 5 seconds and less than or equal to 60 seconds, wherein the trend(s) in tracer activity over time is indicative of a reflux disease.

18. A system according to claim 17 wherein the processing device is further configured to:

- determine, separately, the tracer activity in each of the areas of interest including the pharynx and the oesophagus; and

- determine, for each area of interest, the trend in tracer activity by linear regression of tracer activity over time.

19. A system according to claim 17 or 18 wherein the processing device is further configured to:

- determine, separately, the tracer activity in the upper oesophagus and the lower oesophagus; and

- determine, for the upper oesophagus and the lower oesophagus, the respective trend in tracer activity by least squares fit or linear regression of tracer activity over time.

20. A system according to any one of claims 17 to 19 wherein the SPECT scanner further captures data representative of image frames of a background area, wherein the background area is outside a fluid path of the nasopharynx, larynx, and oesophagus, wherein the processing device is further configured to:

- determine background radiation based on activity in the background area; and

- enhance the data representative of the multiple images by factoring the background radiation.

21. A system according to any one of claims 17 to 20 wherein the areas of interest includes the nasal turbinates, maxillary sinuses, Eustachian tube and/or the middle ears, wherein the processing device is further configured to:

- generate, at a display, one or more representations of the tracer activity at the nasal turbinates, maxillary sinuses, Eustachian tube and/or the middle ears,

wherein the tracer activity at the nasal turbinates, maxillary sinuses, Eustachian tube and/or middle ears is indicative of aspiration of the tracer.

22. A system according to any one of claims 17 to 21, wherein the processing device is further configured to:

- generate, at a display, one or more representations of the one or more trend(s) in tracer activity over time.

23. A computer-implemented method for diagnosing reflux disease in an individual, wherein the individual is administered an oral dose of tracer in 75mL to 200 mL of water, the method comprising:

- receiving, from a single photon emission computed tomography (SPECT) scanner, data representative of multiple image frames of the individual in areas of interest that include the pharynx and oesophagus, wherein the data representative of multiple image frames are captured over time after administration of the oral dose;

- determining one or more trend(s) in tracer activity over time in the areas of interest based on the multiple images of the individual over time, wherein each image frame has a sampling time of greater than 5 seconds and less than or equal to 60 seconds, wherein the trend(s) in tracer activity over time is indicative of a reflux disease.