CLAIMS:

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

- a single photon emission computed tomography (SPECT) scanner, wherein the SPECT scanner is configured to capture data representative of multiple image frames in areas of interest that include at least the pharynx and oesophagus of the individual, wherein the SPECT scanner is further configured to capture data representative of multiple image frames of the individual in a supine position and an upright position;

- a processing device configured to:

- receive, from the SPECT scanner, data representative of multiple image frames of an orally administrated tracer in 75mL to 200 mL of water in areas of interest that include the pharynx and oesophagus, wherein the data representative of multiple image frames of the tracer are captured over time in the areas of interest after administration of the tracer;

- determine one or more trend(s) in tracer activity over time in the areas of interest based on the multiple image frames 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, wherein the tracer includes technetium phytates in the range of 60 to 100 MBq.

2. A system according to claim 1 wherein the processing device is further configured to:

- determine 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, and

wherein a frequency indicative of intermediate laryngopharyngeal reflux is indicative of an increased probability of lung aspiration of refluxate.

3. A system according to claim 2 further comprising:

- an oxygen saturation sensor to capture 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.

4. A system according to any one of claims 1 to 3 wherein the processing device is further configured to:

- determine 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.

5. A system according to any one of claims 1 to 4 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.

6. A system according to any one of claims 1 to 5, 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; and/or

wherein an ascending trend in tracer activity over time in the pharynx is indicative of aspiration of the tracer and laryngopharyngeal reflux.

7. A system according to any one of claims 1 to 6, 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;

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; and/or

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.

8. A system according to any one of claims 1 to 7 wherein the sampling time is in the range of 15 to 30 seconds.

9. A system according to any one of claims 1 to 8 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.

10. A system according to any one of claims 1 to 9 wherein the areas of interest includes the stomach of the individual and the processing device is further configured to:

- determine the tracer activity in the stomach;

- determine, for the stomach, the trend in tracer activity by exponential fit of tracer activity over time; and

- determine 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 prolonged liquid gastric emptying.

11. A system according to any one of claims 1 to 10 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.

12. A system according to any one of claims 1 to 11 wherein the SPECT scanner is a SPECT/CT scanner that further includes x-ray computed tomography to provide data representative of multiple image frames of the individual that includes details of anatomical features of the individual.

13. A system according to any one of claims 1 to 12 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.

14. A system according to any one of claims 1 to 13, 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.