What is claimed is:

1. A method, comprising:

receiving a first set of imaging data including a plurality of annihilation events detected during an imaging period;

generating a plurality of four-dimensional volumetric images from the imaging data for the imaging period, wherein each four-dimensional volumetric image includes a target tissue;

determining at least one motion correction for each of the plurality of four-dimensional volumetric images, wherein the at least one motion correction is determined using target tracking data generated for the target tissue over a time period associated with the four-dimensional volumetric image;

generating corrected image data from the first set of imaging data and the at least one motion correction; and

generating at least one static reconstruction image including the target tissue during the imaging period from the corrected image data.

2. The method of claim 1, wherein determining the at least one motion correction for each of the plurality of four-dimensional volumetric images comprises:

generating at least one dynamic image including the target tissue for a predetermined temporal dimension of a selected one of the plurality of four-dimensional volumetric images;

identifying a location of the target tissue within the dynamic image; and

identifying a position of the target tissue within the selected one of the plurality of four-dimensional volumetric images based on the location of the target organ within the dynamic image; and

generating the at least one motion correction for the selected one of the plurality of four-dimensional volumetric images based on the position of the target tissue within the selected one of the plurality of four-dimensional volumetric images.

3. The method of claim 2, wherein the location of the target tissue within the dynamic image is identified using target tracking of the target tissue.

4. The method of claim 2, wherein the at least one dynamic image is generated from a second set of imaging data generated during the imaging period.

5. The method of claim 4, wherein the first set of imaging data is generated by a first imaging modality and the second set of imaging data is generated by a second imaging modality.

6. The method of claim 1, wherein generating the corrected image data from the first set of imaging data and the at least one motion correction comprises:

determining at least one axial plane shift value for each of the plurality of four-dimensional volumetric images;

shifting a subset of the first set of imaging data by the at least one axial plane shift value; and

generating a sinogram from the shifted subset.

7. The method of claim 1, wherein the first set of imaging data comprises a listmode data set.

8. The method of claim 1, wherein the time period associated with the four-dimensional volumetric image is 1 second.

9. The method of claim 1, wherein the target tissue is an organ.

10. A system, comprising:

a first imaging modality configured to generate a first set of imaging data including a plurality of annihilation events during a first imaging period; and

a computer, wherein the computer is configured to:

receive the first set of imaging data;

generate a plurality of four-dimensional volumetric images from the imaging data for the imaging period, wherein each four-dimensional volumetric image includes a target tissue;

determine at least one motion correction for each of the plurality of four-dimensional volumetric images, wherein the at least one motion correction is determined using target tracking data generated for the target tissue over a time period associated with the four-dimensional volumetric image;

generate corrected image data from the first set of imaging data and the motion vector offsets; and

generate at least one static reconstruction image including the target tissue during the imaging period from the corrected image data.

11. The system of claim 10, wherein the computer is configured to:

generate at least one dynamic image including the target tissue for a predetermined temporal dimension of a selected one of the plurality of four-dimensional volumetric images;

identify a location of the target tissue within the dynamic image; and

identify a position of the target tissue within the selected one of the plurality of four-dimensional volumetric images based on the location of the target organ within the dynamic image; and

generate the at least one motion correction for the selected one of the plurality of four-dimensional volumetric images based on the position of the target tissue within the selected one of the plurality of four-dimensional volumetric images.

12. The system of claim 11, wherein the location of the target tissue within the dynamic image is identified using target tracking of the target tissue.

13. The system of claim 11, comprising a second imaging modality configured to generate a second set of imaging data during the second imaging period, wherein the at least one dynamic image is generated from the second set of imaging data.

14. The system of claim 10, wherein the first imaging modality is a positron emission tomography (PET) imaging modality.

15. The system of claim 10, wherein the computer is configured to:

determine at least one axial plane shift value for each of the plurality of four-dimensional volumetric images;

shift a subset of the first set of imaging data by the axial plane shift value; and

generate a sinogram from the shifted subset.

16. The system of claim 10, wherein the computer is configured to convert the first set of imaging data to listmode data.

17. The system of claim 10, wherein the time period associated with the four-dimensional volumetric image is 1 second.

18. A non-transitory computer readable medium storing instructions configured to cause a computer system to execute the steps of:

receiving a first set of imaging data including a plurality if annihilation events detected during an imaging period;

generating a plurality of four-dimensional volumetric images from the imaging data for the imaging period, wherein each four-dimensional volumetric image includes a target tissue;

determining at least one motion correction for each of the plurality of four-dimensional volumetric images, wherein the at least one motion correction is determined using target tracking data generated for the target tissue over a time period associated with the four-dimensional volumetric image;

generating corrected image data from the first set of imaging data and the at least one motion correction; and

generating at least one static reconstruction image including the target tissue during the imaging period from the corrected image data.

19. The non-transitory computer readable medium of claim 18, wherein the computer system is configured to execute the steps of:

generating at least one dynamic image including the target tissue for a predetermined temporal dimension of a selected one of the plurality of four-dimensional volumetric images;

identifying a location of the target tissue within the dynamic image; and

identifying a position of the target tissue within the selected one of the plurality of four-dimensional volumetric images based on the location of the target tissue within the dynamic image; and

generating the at least one motion correction for the selected one of the plurality of four-dimensional volumetric images based on the position of the target tissue within the selected one of the plurality of four-dimensional volumetric images.

20. The non-transitory computer readable medium of claim 18, wherein the computer system is configured to execute the steps of:

determining at least one axial plane shift value for each of the plurality of four-dimensional volumetric images;

shifting a subset of the first set of imaging data by the at least one axial plane shift value; and

generating a sinogram from the shifted subset.