**WHAT IS CLAIMED IS:**

1. A magnetic resonance (MR) imaging system comprising:

a solenoid magnet shaped to radially enclose an inner bore and configured to generate a static magnetic field that runs axially through the radially enclosed inner bore; and

an annular coil assembly housed within at least a portion of the inner bore of the solenoid magnet, the annular coil assembly comprising

a gradient coil configured to generate perturbations to the static magnetic field that runs axially through the radially enclosed inner bore,

wherein the annular coil assembly has an aperture formed therein that runs axially inside the radially enclosed inner bore and extends the full length of the solenoid magnet to an edge of the solenoid magnet,

wherein the aperture is radially arranged inside the radially enclosed inner bore in such manner that the gradient coil of the annular coil assembly remains viable to generate perturbations to the static magnetic field that runs axially through the radially enclosed inner bore, thereby allowing formation of MR signals that encode a portion of a subject placed inside the radially enclosed inner bore, and

wherein the annular coil assembly and the magnet are rotatable relative to each other such that a position of the aperture within the magnet is variable.

2. The magnetic resonance imaging system according to claim 1, wherein

the annular coil assembly is rotatable relative to the magnet when the annular coil assembly is not locked; and

the annular coil assembly is not rotatable relative to the magnet when the annular coil assembly is locked.

3. The magnetic resonance imaging system according to claim 1, wherein the aperture is formed in one or more of the ‘x’, ‘y’, or ‘z’ gradient axes or shields.

4. The magnetic resonance imaging system according to claim 1 further comprising a patient table slidable within the annular coil assembly.

5. The magnetic resonance imaging system according to claim 1, wherein the aperture is located in the upper hemisphere of the annular coil assembly.

6. The magnetic resonance imaging system according to claim 1, wherein the aperture is located in the lower hemisphere of the annular coil assembly.

7. The magnetic resonance imaging system according to claim 1, wherein the aperture is sized to house at least a portion of a breathing apparatus, an intra-operative device, an infusion apparatus, a display device, a projection screen, or a camera.

8. The magnetic resonance imaging system of claim 6 further comprising a display device, a projection screen, or a camera located within the aperture.

9. The magnetic resonance imaging system according to claim 1, wherein the annular coil assembly further comprises a transmit coil.

10. The magnetic resonance imaging system according to claim 1, further comprising:

a radio-frequency coil sized to encompass the subject's head, wherein the radio-frequency coil is configured to receive the MR signals emitted from within the subject's head, and wherein coil assembly is sized to house the radio-frequency coil.

11. The MR imaging system according to claim 1, wherein the gradient coil of the annular coil assembly is configured to provide a gradient variation to the static magnetic field in more than one spatial direction, and wherein none of the more than one spatial direction are directed at the aperture of the annular coil assembly.

12. The MR imaging system according to claim 1, wherein the main magnet is a transportable magnet.

13. A method for imaging a subject, comprising:

placing a portion of the subject in an annular coil assembly housed within at least a portion of a radially enclosed inner bore of a solenoid magnet that is configured to generate a static magnetic field that runs axially through the radially enclosed inner bore, wherein the annular coil assembly has an aperture formed therein that runs axially inside the radially enclosed inner bore and extends the full length of the solenoid magnet to an edge of the solenoid magnet; and

initiating an imaging sequence to image the subject using the annular coil assembly and the solenoid magnet, wherein the aperture is radially arranged inside the radially enclosed inner bore in such manner that the gradient coil of the annular coil assembly remains viable to generate perturbations to the static magnetic field that runs axially through the radially enclosed inner bore, thereby allowing formation of MR signals that encode a portion of a subject placed inside the radially enclosed inner bore.

14. The method of claim 13, further comprising:

rotating the annular coil assembly relative to the solenoid magnet such that a portion of the subject is aligned with an apparatus, wherein at least a portion of the apparatus is housed within the aperture of the annular coil assembly.

15. The method of claim 14, further comprising:

fixing the annular coil assembly relative to the magnet before initiating the imaging sequence.

16. The method of claim 13, further comprising:

loading the patient on a slidable table; and

sliding the table into an inner bore of the solenoid magnet.

17. The method of claim 13, further comprising:

passing a breathing tube through the aperture of the annular coil assembly to the subject's face that is aligned with the aperture; and

providing anesthesia to the subject through the breathing tube while the subject is being imaged.

18. The method of claim 14, further comprising:

inserting a radio-frequency (RF) receiver coil into the aperture of the annular coil assembly before initiating the imaging sequence.

19. The method of claim 18, wherein rotating the annular coil assembly relative to the magnet causes the radio-frequency receiver coil to be placed at an access port on the subject's head through which an interventional procedure is being performed; and initiating the imaging sequence further includes using the radio-frequency receiver coil to image the subject during the interventional procedure based on the access port.

20. The method of claim 14, further comprising communicating with the subject while the subject is being imaged using a display device or projection screen housed within the aperture of the annular coil assembly.

21. The method of claim 14, further comprising:

monitoring the subject while the subject is being imaged using a camera device housed within the aperture of the annular coil assembly.

22. A magnetic resonance imaging system comprising:

a solenoid magnet comprising a radially enclosed inner bore that includes a first edge and second edge, the solenoid magnet configured to generate a static magnetic field that runs axially through the inner bore from the first edge to the second edge; and

an annular coil assembly housed within at least a portion of the inner bore of the solenoid magnet, the coil assembly comprising a gradient coil configured to generate perturbations to the static magnetic field that runs axially through the radially enclosed inner bore,

wherein the annular coil assembly has an aperture formed therein that originates at the first edge of the solenoid magnet and extends longitudinally towards the second edge of the solenoid magnet, the aperture radially arranged inside the radially enclosed inner bore in such

manner that the gradient coil of the annular coil assembly remains viable to generate perturbations to the static magnetic field that runs axially through the radially enclosed inner bore, allowing formation of MR signals that encode a portion of a subject placed inside the radially enclosed inner bore, and

wherein the annular coil assembly and the magnet are rotatable relative to each other such that a position of the aperture within the magnet is variable.