CLAIMS

What is Claimed:

1. A neuronavigated transcranial magnetic stimulation system comprising:

i) a pulse generator;

ii) two transcranial magnetic stimulation (TMS) coils side-by-side in a housing and configured to be placed over a target brain region of a patient's head for treatment; and

iii) one or more imaging devices including a single camera central to centers of the TMS coils and configured to permit direct visualization of a position of the TMS coils relative to a target position on the patient's head, wherein the single camera overlies the common focal point of the TMS coils.

2. The neuronavigated transcranial magnetic stimulation system of claim 1, wherein the one or more imaging devices comprises one or more cameras, including the single camera overlies the common focal point of the TMS coils.

3. The neuronavigated transcranial magnetic stimulation system of claim 2, wherein the one or more imaging devices comprises one or more visible light imaging cameras, one or more ultraviolet light imaging cameras or one or more infrared imaging cameras.

4. The neuronavigated transcranial magnetic stimulation system of claim 3, wherein the one or more imaging devices are configured to transmit an image of the patient's scalp vasculature, the patient's skin patterns, the patient's skull bone structure, or the patient's brain tissue.

5. The neuronavigated transcranial magnetic stimulation system of claim 2, wherein the one or more imaging devices also comprises two or more cameras located to sides of the TMS coils.

6. The neuronavigated transcranial magnetic stimulation system of claim 2, wherein the one or more imaging devices also comprises two or more cameras located away from the center but within the housing of the TMS coils.

7. The neuronavigated transcranial magnetic stimulation system of claim 1, further comprising one or more accelerometers configured to sense orientation placement or changes in orientation of the TMS coils.

8. The neuronavigated transcranial magnetic stimulation system claim 1, further comprising one or more contact sencors configured to detect contact and force between the TMS coils and the patient's head.

9. The neuronavigated transcranial magnetic stimulation system of claim 8, wherein the contact sensors comprise one or more force-sensitive resistors, one of more capacitive touch sensors, or one or more ultrasonic position/touch sensors.

10. The neuronavigated transcranial magnetic stimulation system of claim 1, further comprising one or more imaging devices external to the TMS coils, and configured to permit simultaneous visualization of the patient's head as well as the TMS coils.

11. The neuronavigated transcranial magnetic stimulation system of claim 10, wherein the one or more imaging devices external to the TMS coils comprises one or more cameras, one or more LIDAR detectors, or one or more ultrasonic detectors.

12. The transcranial magnetic stimulation system of claim 1, further comprising a memory device configured to create a record of the TMS coils position before and during treatment.

13. A transcranial magnetic stimulation kit comprising a transcranial magnetic stimulation system, comprising:

i) a pulse generator;

ii) two transcranial magnetic stimulation (TMS) coils in a housing and configured to be placed over the target brain region of a patient for treatment; iii) one or more imaging devices including a single camera central to centers of the TMS coils and configured to permit direct visualization of a position of the TMS coils relative to a target position on the patient's head, wherein the single camera overlies the common focal point of the TMS coils; and

iv) a patient head cap having at least one of grid markings, text and color markings configured to overlie anatomical locations on the head of the patient.

14. The transcranial magnetic stimulation kit of claim 13, including marking configured to overlie target areas of the head of the patient.

15. The transcranial magnetic stimulation kit of claim 13, including markings configures to permit continuous measurement of the relative position and orientation of the cap versus the patient's head before, during, and after treatment.

16. The neuronavigated transcranial magnetic stimulation kit of claim 13, wherein the one or more imaging devices comprises one or more cameras, including the single camera central to the centers of the TMS coils.

17. The neuronavigated transcranial magnetic stimulation kit of claim 16, wherein the one or more cameras comprise one or more visible light imaging cameras, one or more ultraviolet light imaging cameras or one or more infrared imaging cameras.

18. The neuronavigated transcranial magnetic stimulation kit of claim 17, wherein the one or more imaging devices are configured to transmit an image of the patient's scalp vasculature, the patient's skin patterns, the patient's skull bone structure, or the patient's brain tissue.

19. The neuronavigated transcranial magnetic stimulation kit of claim 16, wherein the one or more imaging devices also comprises one or more cameras located away from the center but within the housing of the TMS coils.

20. The neuronavigated transcranial magnetic stimulation kit of claim 13, further comprising one or more contact sensors configured to detect contact and force between the TMS coils and the patient's head.

21. The neuronavigated transcranial magnetic stimulation kit of claim 13, further comprising one or more accelerometers configured to sense orientation placement or changes in orientation of the TMS coils.

22. The neuronavigated transcranial magnetic stimulation kit of claim 20, wherein the one or more contact sensors comprises one or more force-sensitive resistors, one or more capacitive touch sensors, or one or more ultrasonic position/touch sensors.

23. The neuronavigated transcranial magnetic stimulation kit of claim 13, further comprising one or more imaging devices external to the two TMS coils, and configured to permit simultaneous visualization of the patient's head as well as the TMS coils.

24. The neuronavigated transcranial magnetic stimulation kit of claim 13, wherein the one or more imaging devices comprises one or more cameras including single camera central to the centers of the TMS coils, one or more LIDAR detectors, or one or more ultrasonic detectors.

25. The transcranial magnetic stimulation kit of claim 13, further comprising a memory device configured to create a record of the TMS coil(s) position before and during treatment.

26. The transcranial magnetic stimulation kit of claim 13, further comprising a memory device configured to create a record of the TMS coils position before and during treatment.