WHAT IS CLAIMED IS:

1. A denoising system for denoising an ECG signal comprising transitory noise caused by application of electrical stimulation by a stimulation device, the denoising system being communicatively coupled to an ECG electrode array configured to obtain ECG signals from a patient, the denoising system comprising:

circuitry configured to:

detect portions of the ECG signal comprising the transitory noise by identifying portions of the ECG signal corresponding to time periods when a synchronization signal is received from an electrical stimulation system indicative of electrical stimulation being administered; and

denoise the detected portions of the ECG signal comprising the transitory noise, wherein denoising the detected portions of the ECG signal comprises blanking the detected portions of the ECG signal comprising the transitory noise and modifying the blanked portions to provide a modified ECG signal with reduced transitory noise.

2. The system of Claim 1, wherein the circuitry comprises one or more processors further configured to:

digitize the detected portions of the ECG signal comprising the transitory noise;

refine the modified ECG signal using at least one of a linear phase filter or a digital finite impulse response filter to create a denoised ECG signal;

convert the denoised ECG signal into an analog signal to facilitate output on a display; and

output the denoised ECG signal for presentation on the display.

3. The system of Claim 2, further comprising a digital-to-analog converter configured to convert the denoised ECG signal into the analog signal.

4. The system of any one of the preceding claims, further comprising:

a patient monitor comprising a display configured to display the output; and

the stimulation device.

5. The system of any one of the preceding claims, wherein said blanking comprises temporarily removing values stored at memory locations corresponding to the detected portions of the ECG signal comprising the transitory noise and wherein said

modifying the blanked portions comprises interpolation, and wherein said interpolation comprises calculating modified values to replace the removed values in the memory locations.

6. The system of any one of Claims 1 to 4, wherein said blanking comprises temporarily removing values stored at memory locations corresponding to the detected portions of the ECG signal comprising the transitory noise and wherein said modifying the blanked portions comprises interpolation, and wherein said interpolation comprises identifying a last value prior to said blanking and a first value after said blanking and replacing the removed values in the memory locations with interpolated values between the last value and the first value in the memory locations.

7. The system of Claim 6, wherein the circuitry comprises one or more processors further configured to filter out 50 Hz or 60 Hz line frequency components for a time period prior to said blanking and following said blanking to ensure the first value and the last value are not affected by the 50 Hz or 60 Hz line frequency components.

8. The system of any one of Claims 1 to 4, wherein said blanking comprises temporarily removing values stored at memory locations corresponding to the detected portions of the ECG signal comprising the transitory noise and wherein said modifying the blanked portions comprises replacing the removed values with a last known good value prior to said blanking.

9. The system of any one of the preceding claims, wherein the system comprises one or more switches configured to open and close based on the synchronization signal.

10. The system of Claim 1, wherein the circuitry comprises sample and hold circuitry.

11. The system of any one of the preceding claims, further comprising a physiological parameter determination subsystem, the physiological parameter determination subsystem configured to, upon execution of stored instructions on a non-transitory computer-readable medium determine whether a physiological parameter being monitored is outside of a threshold range based, at least in part, on signals indicative of the physiological parameter received from one or more sensors coupled to or positioned within the patient,

wherein, when the physiological parameter determination subsystem determines that the physiological parameter is outside of the threshold range,

application of electromagnetic stimulation by the stimulation device is terminated and the denoising system is bypassed, and

wherein, when the physiological parameter determination subsystem determines that the physiological parameter is within the threshold range, application of electromagnetic stimulation by the stimulation device continues and the ECG signal is processed by the denoising system.

12. A method of denoising a physiological signal obtained from a patient, the physiological signal comprising transitory noise caused by application of electromagnetic energy by a source of electromagnetic energy located within or adjacent the patient, the method comprising:

detecting portions of the physiological signal comprising the transitory noise;

blanking the detected portions of the physiological signal comprising the transitory noise; and

interpolating the detected portions of the physiological signal comprising the transitory noise to reconstruct the physiological signal as a reconstructed physiological signal;

wherein the detecting, blanking and interpolating are performed by one or more processors executing instructions stored on a non-transitory computer-readable medium.

13. The method of Claim 12, wherein the physiological signal is a cardiac-related signal.

14. The method of Claim 13, wherein the cardiac-related signal is an ECG signal.

15. The method of any one of Claims 12 to 14, wherein the step of detecting portions of the physiological signal that comprise the transitory noise is based on a blanking pulse received from an electrical tissue modulation system that is likely to generate the transitory noise on the physiological signal.

16. The method of Claim 15, wherein the blanking pulse is received prior to or generally coincident with initiation of electrical neuromodulation therapy by the electrical tissue modulation system.

17. The method of any one of Clams 12 to 16, further comprising:

digitizing the portions of the physiological signal having the transitory noise using an analog-to-digital converter prior to blanking the detected portions of the physiological signal having the transitory noise

converting the denoised physiological signal into an analog signal using a digital-to-analog converter to facilitate output of the denoised physiological signal on a display; and

outputting the analog signal to the display,

wherein the display is on a patient monitor or a central monitoring system.

18. The method of any one of Claims 12 to 17, wherein said blanking comprises temporarily removing values at memory locations corresponding to the detected portions of the physiological signal having the transitory noise, and wherein said interpolating comprises replacing the removed values during said blanking with modified values.

19. A denoising system for removing a transitory noise from a digitized biopotential of a living being, said transitory noise generated synchronous with electrical stimulation of a portion of a body of the living being, said system comprising one or more processors configured to, upon execution of instructions stored on a non-transitory computer-readable medium:

receive a synchronization signal from an electrical stimulation system indicative of timing of the electrical stimulation;

remove said transitory noise from the digitized biopotential based upon receipt of the received synchronization signal; and

interpolate across a gap created in the digitized biopotential to create a digitized biopotential free of transitory noise.

20. The system of Claim 19, wherein:

the digitized biopotential is an ECG waveform,

the electrical stimulation system is a neurostimulator, and

the synchronization signal comprises a pulse.

21. The system of Claim 19, wherein:

denoising the digitized biopotential comprises removing values in memory locations corresponding to portions of the digitized biopotential having the transitory noise, and/or

interpolating across the gap comprises replacing the removed values with modified values to create a denoised biopotential.