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Complexity and Unpredictability; 4.1.1 Scaling Measures; 4.2 Fractal Stochastic Dynamics; 4.2.1 Simple Random Walks
4.2.2 Fractional random walks and scaling4.2.3 Physical/physiological models; 4.3 Physiologic Time Series; 4.3.1 Heart Rate Variability (HRV); 4.3.2 Breath rate variability (BRV); 4.3.3 Stride rate variability (SRV); 4.4 Summary and Viewpoint; 5 Applications of Chaotic Attractors; 5.1 The Dynamics of Epidemics; 5.2 Chaotic Neurons; 5.3 Chemical Chaos; 5.4 Cardiac Chaos; 5.5 EEG Data and Brain Dynamics; 5.5.1 Normal activity; 5.5.2 Epilepsy: reducing the dimension; 5.5.3 Task-related scaling; 5.6 Retrospective; 6 Physiological Networks: The Final Chapter?; 6.1 Introduction to Complex Networks
6.1.1 A little history6.1.2 Inverse power laws; 6.2 The Decision Making Model (DMM); 6.2.1 Topological Complexity; 6.2.2 Temporal Complexity; 6.3 Criticality; 6.3.1 Neuronal Avalanches; 6.3.2 Multiple Organ Dysfunction Syndrome (MODS); 6.4 Finale; References; Index

Sommario/riassunto

This exceptional book is concerned with the application of fractals and chaos, as well as other concepts from nonlinear dynamics to biomedical phenomena. Herein we seek to communicate the excitement being experienced by scientists upon making application of these concepts within the life sciences. Mathematical concepts are introduced using biomedical data sets and the phenomena being explained take precedence over the mathematics.In this new edition what has withstood the test of time has been updated and modernized; speculations that were not borne out have been expunged and the breakthroughs