Clinical Case Studies: Phase-Lock Programming as Therapeutic Mechanism

Case 1: Major Depressive Disorder (MDD)

Pathology	Intervention	Outcome

Monoamine Phase Desynchronization
- Serotonin oscillators unlocked
- Dopamine phase drift
- Order parameter r = 0.20

SSRI (Sertraline 50-200 mg/day)
- Enhances serotonin coupling
- K: 0.5 → 0.75
- Q = 1.4 (EM resonance)

Monoamine Synchronization
- Serotonin oscillators locked
- Dopamine phase coherent
- Order parameter r = 0.85

Desync   SSRI / Phase-Lock   Sync

Case 2: Generalized Anxiety Disorder (GAD)

Pathology	Intervention	Outcome

GABA-Glutamate Imbalance
- Hyperactive glutamate
- Insufficient GABA coupling
- Oscillatory instability

Benzodiazepine + SSRI
- Enhances GABA coupling
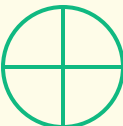- Stabilizes glutamate phase
- Dual-target phase-lock

Excitatory-Inhibitory Balance
- GABA-Glutamate locked
- Stable oscillatory regime
- Reduced anxiety symptoms

Chaotic   BZD SSRI / Combo   Balanced

Case 3: Metabolic Syndrome

Pathology	Intervention	Outcome

Metabolic Flux Cascade Failure
- TCA cycle blockage (L3)
- Downstream levels inactive
- End-to-end flux = 0%

Metformin (500-2000 mg/day)
- Restores TCA cycle coupling
- Enhances mitochondrial phase
- Q = 1.1 (moderate resonance)

Metabolic Flux Restoration
- TCA cycle reactivated
- Downstream levels functional
- End-to-end flux = 29.8%

Blocked   Unblock   Flowing