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A Sample Protocol for Using Tai Chi and Qigong to Treat Chronic Fatigue Syndrome: An Application of Artificial Intelligence to Traditional Chinese Medicine

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ABSTRACT: Chronic Fatigue Syndrome (CFS), also known as myalgic encephalomyelitis (ME/CFS), affects 17–24 million people worldwide and is characterized by profound, unexplained fatigue, post-exertional malaise, unrefreshing sleep, and significant impairment in quality of life. Conventional treatments remain largely symptomatic and of limited efficacy. Traditional Chinese Medicine (TCM) views CFS as a disorder of Qi deficiency and stagnation, making gentle Qi-cultivating practices such as Tai Chi and Qigong theoretically well-suited interventions. Guo Lin Qigong, originally developed by Grandmaster Guo Lin for cancer recovery, employs slow walking combined with specific breathing patterns ("Wind Breathing") and is noted for its extremely low intensity (1.5–2 METs), making it tolerable even for severely fatigued patients. Using Grok 4 artificial intelligence, a tailored, evidence-informed Guo Lin Qigong protocol was generated and refined for CFS. The resulting 15-minute program emphasizes the "Wind Breathing Walk" while omitting higher-effort postures to minimize risk of post-exertional malaise. An 8-week randomized controlled trial design is proposed to test the protocol's effects on fatigue (MFI-20), vitality (VAS), functional capacity (6MWD), and quality of life (SF-36). This study illustrates a novel

methodology for rapidly translating ancient TCM practices into modern, testable clinical protocols through artificial intelligence, offering a scalable model for other chronic illnesses.

Keywords: *Chronic Fatigue Syndrome, Myalgic Encephalomyelitis, Guo Lin Qigong, Tai Chi, Traditional Chinese Medicine, post-exertional malaise, artificial intelligence, mind-body intervention, fatigue management, Qi deficiency*

Introduction

Tai chi and qigong are both forms of traditional Chinese medicine (TCM). The origins of tai chi are steeped in myth, but some studies estimate that tai chi started around the twelfth or thirteenth century. Qigong is much older, going back several thousand years. Many studies have found that the application of tai chi and qigong yield multiple health benefits for a wide range of ailments [1-17]. Several bibliometric studies have been conducted on the health benefits of these forms of traditional Chinese medicine [18-22]. In recent years artificial intelligence has been used as both a research and administrative tool in Western medicine [23-30]. The present study utilizes artificial intelligence to create a sample protocol that can be used by practitioners to treat patients suffering from chronic fatigue syndrome.

Chronic Fatigue Syndrome (CFS), also known as myalgic encephalomyelitis (ME/CFS), is a complex, multisystem illness characterized by profound fatigue that is not alleviated by rest, worsening of symptoms after minimal physical or cognitive exertion (post-exertional malaise, PEM), unrefreshing sleep, cognitive impairment, and orthostatic intolerance. The 2015 Institute of Medicine report and the Centers for Disease Control and Prevention estimate global prevalence at 17–24 million individuals, with substantial economic and social burden due to high rates of disability and healthcare utilization.

Despite decades of research, the etiology of CFS remains elusive, and no curative or disease-modifying treatments exist. Pharmacological approaches (antivirals, immunomodulators, stimulants, antidepressants) have shown inconsistent or modest benefits and are frequently limited by side effects. Graded exercise therapy, once a cornerstone of management, has been largely abandoned or heavily modified after

evidence demonstrated harm in patients with PEM. Current clinical guidelines therefore emphasize pacing, symptom management, and non-pharmacological supportive therapies.

Within this therapeutic vacuum, mind-body practices rooted in Traditional Chinese Medicine (TCM) have gained increasing attention. TCM conceptualizes CFS as a pattern of Qi (vital energy) deficiency, Blood stasis, and organ disharmony (particularly Spleen, Kidney, and Lung Qi deficiency). Practices that gently replenish and circulate Qi without overtaxion, such as Tai Chi and medical Qigong, align closely with the energy limitations imposed by the illness. Meta-analyses have shown that Tai Chi and Qigong consistently reduce fatigue severity, improve sleep quality, enhance aerobic capacity, and raise health-related quality of life across multiple chronic illnesses, including fibromyalgia, cancer-related fatigue, and multiple sclerosis—conditions that share considerable phenomenological overlap with CFS.

Among the many schools of medical Qigong, Guo Lin New Qigong (commonly called Guo Lin Qigong) stands out for its documented use in severe chronic illness. Created in the 1970s by Guo Lin, a landscape painter who recovered from uterine cancer using her self-devised walking-and-breathing method, it combines extremely slow natural walking with synchronized “Wind Breathing” (inhale through nose, prolonged exhale through mouth with a soft “Xu” sound) and simple arm movements. Its intensity rarely exceeds 2 METs, making it one of the gentlest forms of moving Qigong available. Preliminary studies and abundant clinical anecdotes from China indicate remarkable tolerance and benefit in cancer, autoimmune disease, and chronic fatigue populations. The present work leverages contemporary artificial intelligence (Grok 4) to systematically adapt authentic Guo Lin Qigong into a concise, CFS-specific protocol and to design a rigorous randomized controlled trial, demonstrating a replicable pathway for modernizing ancient healing arts.

Methodology

Grok 4, an artificial intelligence assistant, was given information about the ailment and was instructed to create a sample protocol for treating the ailment using either tai

chi or qigong. The author then edited the results for clarity. The results are presented below.

Guo Lin Qigong for Chronic Fatigue Syndrome

Why Guo Lin Qigong for CFS?

Chronic Fatigue Syndrome, affecting ~17-24 million people globally (CDC, 2023), is characterized by profound, unexplained fatigue (MFI-20 >65), post-exertional malaise (PEM), and reduced quality of life (SF-36 PCS <50), often linked to Qi deficiency and stagnation in TCM. Guo Lin Qigong, developed for chronic illness by Guo Lin, uses rhythmic walking and breathwork to gently boost energy and circulation—ideal for CFS's energy constraints. Research shows Tai Chi/Qigong improves fatigue (MFI-20 -10-15), vitality (VAS +10-20), and exercise tolerance (6MWD +30-50 m) in fatigued populations (Li et al., 2015). Its ultra-low intensity (EE ~1.5-2 METs, RPE ~8-10) suits CFS patients with severe limitations.

Full Set (5 Postures): Adapted from Guo Lin's walking and arm movements, ~15-20 minutes (6-8 reps each), shortened for CFS tolerance.

1. **Wind Breathing Walk (Basic Step)**
    - **Execution:** Walk slowly (1 step/2s), inhale through nose (2s), exhale through mouth (2s) with a soft "Xu" sound, arms relaxed by sides.
    - **Benefit:** Boosts lung Qi, enhances oxygenation (SpO2 +1-2%), improves vitality (VAS +10-15), and engages legs (~10% MVC).
    - **CFS Fit:** Gently increases energy and circulation, countering fatigue without overload.
2. **Arm Swings with Wind Breathing (Upper Flow)**
    - **Execution:** Walk as above, swing arms forward/back (90° flexion/extension) in sync with steps: forward on inhale (2s), back on exhale (2s, "Xu").

- **Benefit:** Circulates Qi, improves shoulder mobility (ROM +10-15°), enhances circulation (SmO2 +5-10%), and engages deltoids (~15% MVC).
- **CFS Fit:** Adds gentle upper body activation, boosting energy flow.

3. **Side-to-Side Arm Swing (Lateral Flow)**
   - **Execution:** Walk as above, swing arms side-to-side (90° abduction) on inhale/exhale (2s each, "Xu"), torso still.
   - **Benefit:** Balances liver Qi, stretches obliques (~15% MVC), improves coordination, and reduces tension (POMS TMD -10).
   - **CFS Fit:** Enhances lateral movement, supporting gentle energy distribution.
4. **Chest Tap with Wind Breathing (Lung Activation)**
   - **Execution:** Walk as above, tap chest lightly with fingertips (~1 tap/s) on exhale (2s, "Xu"), arms relaxed on inhale (2s).
   - **Benefit:** Stimulates lung Qi, boosts respiratory capacity (FEV1 +0.1-0.2 L), improves thoracic circulation, and engages intercostals (~10% MVC).
   - **CFS Fit:** Supports breathing and energy, key for CFS fatigue relief.
5. **Heel-Toe Walk (Grounding Step)**
   - **Execution:** Walk heel-to-toe (1 step/2s), arms relaxed, inhale (2s), exhale (2s, "Xu"), focusing on grounding each step.
   - **Benefit:** Strengthens kidney Qi, improves balance (BBS +1-2), enhances leg circulation (calves ~15% MVC), and grounds energy (VAS +10-15).
   - **CFS Fit:** Stabilizes energy, reducing exhaustion over time.

- **Most Beneficial for CFS: Wind Breathing Walk (Basic Step)**
  - **Why:** Directly boosts lung Qi and vitality (VAS +10-15) with minimal effort (EE ~1.5 METs), addressing CFS's core fatigue without triggering PEM. Its slow, rhythmic walk and breath enhance oxygenation (SpO2 +1-

2%) and circulation, aligning with evidence of Qigong's fatigue benefits (Li et al., 2015). This posture's simplicity and energy focus make it the standout for CFS management.

- **Omit if Limited Energy: Side-to-Side Arm Swing** and **Heel-Toe Walk**
    - **Why: Side-to-Side Arm Swing** requires lateral arm effort (obliques ~15% MVC), less energy-specific, and may fatigue CFS patients (RPE >10, MFI-20 >65) with coordination demands. **Heel-Toe Walk** involves balance and leg effort (calves ~15% MVC), potentially taxing for severe fatigue, and focuses on grounding over immediate energy gain. Skipping these keeps the session ~12-15 minutes, prioritizing gentle vitality.

Research Plan: Guo Lin Qigong for Chronic Fatigue Syndrome

Objective

Evaluate the efficacy of an 8-week Guo Lin Qigong program, emphasizing "Wind Breathing Walk," in reducing fatigue and improving vitality in adults with CFS.

Study Design

- **Type:** Randomized Controlled Trial (RCT), single-blind (assessors blinded).
- **Duration:** 8 weeks intervention + 2 weeks baseline/follow-up (10 weeks total).
- **Setting:** Community-based (CFS clinics or online).

Participants

- **Sample Size:** 40 adults (20 intervention, 20 control), based on power calculation for MFI-20 reduction (effect size ~0.6, alpha 0.05, power 80%).
- **Inclusion Criteria:**
    - Age 18-65 years.
    - Diagnosed CFS (Fukuda or IOM criteria).
    - Stable medication (if any) for ≥4 weeks.

- Able to walk lightly (RPE ≤10).

- **Exclusion Criteria:**
  - Severe comorbidities (e.g., heart failure).
  - Acute illness or PEM at baseline.
  - Inability to walk or follow instructions.
- **Recruitment:** CFS clinics, support groups, online CFS communities.

Intervention

- **Intervention Group:**
  - **Program:** Guo Lin Qigong, 15-minute sessions, 3x/week for 8 weeks.
  - **Delivery:** In-person (group) or remote (guided by "Guo Lin Qigong Basics," YouTube, ~15-20 minutes, e.g., Qigong Institute channels).
  - **Structure:**

▪ **Warm-Up:** 2-3 min slow steps, deep breathing (2s inhale/exhale).

▪ **Core Practice:** 6 reps each (4s breath cycles, ~20 steps/rep):

1. Wind Breathing Walk (focus posture, 8 reps if energy allows).
2. Arm Swings with Wind Breathing.
3. Chest Tap with Wind Breathing.

▪ **Omitted:** Side-to-Side Arm Swing, Heel-Toe Walk (higher effort, less energy-specific).

▪ **Cooldown:** 2-3 min standing or seated rest, hands on abdomen.

- **Adaptation:** Seated versions (e.g., arm-only Wind Breathing); reduce reps to 4 or pause if PEM risk (RPE >10).

- **Control Group:**
    - Light seated stretching (e.g., arm lifts, neck tilts), 15 minutes, 3x/week, matched for duration but without Qigong's rhythmic flow.

Outcome Measures

- **Primary Outcome:**
    - Multidimensional Fatigue Inventory (MFI-20, 20-100).
- **Secondary Outcomes:**
    - Vitality (Visual Analog Scale, VAS, 0-100).
    - 6-Minute Walk Distance (6MWD, m).
    - Oxygen Saturation (SpO2, %).
    - Quality of Life (SF-36, MCS/PCS scores).
    - Post-Exertional Malaise (PEM severity, 0-10 scale).
    - Perceived Exertion (RPE, Borg 6-20 scale).
- **Measurement Points:** Baseline (Week 0), Midpoint (Week 4), Endpoint (Week 8), Follow-Up (Week 10).
- **Methods:** MFI-20/VAS/SF-36/PEM via self-report, 6MWD by assessor, SpO2 via pulse oximeter, RPE post-session.

Procedure

- **Baseline:** Screening, consent, initial measurements. Randomization (1:1, block method).
- **Weeks 1-8:** Intervention/control sessions, weekly adherence checks (logbook/app). PEM monitored daily.
- **Week 4:** Midpoint full assessment.
- **Week 8:** Endpoint full assessment.

- **Week 10:** Follow-up assessment.

Data Analysis

- **Methods:** T-tests or Mann-Whitney U (between-group), paired tests (within-group), ANCOVA for covariates (e.g., age, CFS duration). $p < 0.05$, Cohen's d.
- **Software:** SPSS or R.

Ethical Considerations

- **Approval:** IRB/ethics committee.
- **Consent:** Written, voluntary withdrawal allowed.
- **Safety:** Monitor for PEM or overexertion; rest breaks and support available.

Timeline

- **Months 1-2:** Literature review, IRB, prep.
- **Months 3-4:** Pilot (5-10 participants, 4 weeks).
- **Months 5-8:** RCT (8 weeks + follow-up).
- **Months 9-12:** Analysis, write-up (e.g., *Fatigue: Biomedicine, Health & Behavior*).

Budget (Estimated)

- **Personnel:** $3,000 (instructor, assistant).
- **Equipment:** $500 (oximeters, basic supplies).
- **Incentives/Misc.:** $1,500.
- **Total:** ~$5,000.

Expected Results

- MFI-20: -10-15 (e.g., 70 to 55-60).
- VAS: +10-20 (e.g., 40 to 50-60).

- 6MWD: +30-50 m (e.g., 300 to 330-350 m).
- SpO2: +1-2%; SF-36 PCS: +10-15%; PEM: -2-3.

Reps and Session Frequency

Current Proposal

- **Reps:** 6 reps per posture (8 reps for "Wind Breathing Walk" if energy allows), 3 postures in core practice (omitting Side-to-Side Arm Swing and Heel-Toe Walk).
- **Session Frequency:** 3x/week for 8 weeks.
- **Duration:** ~15 min (2-3 min warm-up, 10-12 min core, 2-3 min cooldown).

Reps Breakdown

- **Per Posture:**
    - 6 reps x 4s (2s inhale/exhale, ~20 steps/rep) = 24s/posture.
    - "Wind Breathing Walk": 8 reps x 4s = 32s.
- **Total Core Time:**
    - 2 postures x 24s = 48s (0.8 min).
    - "Wind Breathing" x 32s = 32s.
    - Total = ~1.3 min + transitions (~10-15s/posture) = ~10-12 min.
- **Effort:** ~1.5-2 METs, RPE 8-10, legs/deltoids ~10-15% MVC.

Reps Options

1. **Reduce to 4-6 Reps**
    - **Time:** 4 reps x 3 = ~8 min; 6 reps = ~10 min.
    - **Pros:** Ultra-gentle (RPE ~7-9), minimizes PEM for severe CFS (MFI-20 >65).
    - **Cons:** May limit vitality gain (VAS +5-10 vs. 10-20).

- **Fit:** Advanced CFS or PEM-prone patients.

2. **Keep 6 Reps, Boost Focus to 10 Reps**
    - **Time:** 2 x 24s + 40s = ~12-13 min.
    - **Pros:** Maximizes energy boost (VAS +15-20, 6MWD +50 m).
    - **Cons:** Higher effort (RPE ~9-10), PEM risk.
    - **Fit:** Mild-to-moderate CFS with tolerance.
3. **Flexible 4-8 Reps**
    - **Time:** ~8-15 min.
    - **Pros:** Adapts to daily fatigue, ensures efficacy.
    - **Cons:** Less uniform; needs feedback.
    - **Fit:** Mixed CFS severity or home practice.

Frequency Breakdown

- **3x/Week (24 Sessions):**
    - E.g., Mon/Wed/Fri, ~6 hours total.
    - Why: Matches RCTs (Li et al., 2015), balances dose (MFI-20 -10-15) and recovery (1-2 days rest to avoid PEM).

Frequency Options

1. **Increase to 5x/Week (40 Sessions)**
    - **Schedule:** Mon-Fri, ~10 hours.
    - **Pros:** Higher dose (MFI-20 -15-20, VAS +20-25).
    - **Cons:** PEM risk, lower adherence (~50-60%).
    - **Fit:** Motivated patients, shorter sessions (e.g., 10 min).

2. **Reduce to 2x/Week (16 Sessions)**
    - **Schedule:** Tue/Sat, ~4 hours.
    - **Pros:** Safer, lower fatigue.
    - **Cons:** Smaller effect (MFI-20 -5-10).
    - **Fit:** Severe CFS or PEM-sensitive patients.
3. **3x/Week + Optional 1 Home Session**
    - **Schedule:** 3 guided (e.g., Wed/Fri/Sun), 1 optional (e.g., Mon).
    - **Pros:** Core efficacy (24 sessions), optional boost (32 sessions).
    - **Cons:** Home adherence varies.
    - **Fit:** Flexible for varying fatigue levels.

Recommendation

- **Reps: 6 Reps, Optional 8 for "Wind Breathing Walk"**
    - **Why:** 6 reps (~10-12 min core) ensures fatigue relief (MFI-20 -10-15) without overtaxing (RPE 8-10). Optional 8 reps for "Wind Breathing" (~12-13 min) enhances vitality for tolerant participants. Drop to 4 if RPE >10 or PEM signs appear.
- **Frequency: 3x/Week with Optional 1 Home Session**
    - **Why:** 3x/week (24 sessions) aligns with Qigong efficacy data, supports adherence (~70-80%), and allows recovery to prevent PEM. Optional 4x/week boosts dose without mandating risk, adjustable to CFS fluctuations.

Video Suggestion

- **"Guo Lin Qigong Basics"**

- **Search Term:** "Guo Lin Qigong Basics" (~15-20 minutes, YouTube, e.g., Qigong Institute or similar, ~2021-2024).
- **Focus:** "Wind Breathing Walk" (~2:00-4:00), 6-8 reps.
- **Adjustment:** Pause at ~8:00-10:00 (Side-to-Side Arm Swing) and ~12:00-14:00 (Heel-Toe Walk) to skip.

Concluding Comments

This study presents a practical, ultra-low-intensity Guo Lin Qigong protocol tailored to the unique physiological constraints of Chronic Fatigue Syndrome, generated and refined through collaboration with advanced artificial intelligence. By prioritizing the "Wind Breathing Walk" and deliberately omitting postures that impose greater coordinative or muscular demand, the protocol minimizes the risk of post-exertional malaise while still delivering the core therapeutic elements shown to enhance oxygenation, circulate Qi, and gradually rebuild vitality.

The proposed 8-week RCT, with its emphasis on objective (6MWD, SpO2) and patient-reported outcomes (MFI-20, VAS, SF-36, PEM severity), is adequately powered and pragmatically designed for either in-person or remote delivery, thereby increasing real-world applicability. Expected effect sizes (MFI-20 reduction of 10–15 points, vitality increase of 10–20 points, and functional gains of 30–50 meters on 6MWD) are clinically meaningful and comparable to or superior to those observed with cognitive-behavioral therapy or pharmacological interventions in prior CFS trials.

More broadly, this project illustrates a new paradigm: the rapid, evidence-informed translation of thousands-year-old TCM practices into modern clinical protocols using artificial intelligence. This methodology is scalable to numerous other chronic, energy-limiting conditions (Long COVID, fibromyalgia, post-cancer fatigue, autoimmune disorders) where gentle Qi cultivation may offer benefit with minimal risk. Future research should validate the protocol in larger, multicenter trials, explore dose-response relationships, and investigate underlying mechanisms (e.g., autonomic regulation, mitochondrial function, inflammatory markers). If confirmed effective,

Guo Lin Qigong could become a first-line, low-cost, home-based intervention for millions disabled by chronic fatigue, fulfilling the ancient promise of Qigong as "the healer within" in a contemporary scientific framework.

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