🩺 BPIT Clinical Study Protocol (Version 3.3): Document1

Date: 2025-12-08

Balanced Progressive Intensity Training (BPIT): Multi-Site Clinical Study on Movement Efficiency, Mobility, and Strength Adaptation

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Institutional Header

MMSx Authority Institute for Movement Mechanics & Biomechanics Research
In Collaboration with BodyGNTX Institute | GFFI India | IIKBS | Bureau of Fitness Standards (BFS) | Active India Health & Fitness Trust (AIHFT)

Field	Detail
Study Title	Balanced Progressive Intensity Training (BPIT): A Five-Week Multi-Site Clinical Evaluation of Functional Movement, Mobility, and Neuromuscular Adaptation in Healthy Adults (18-65 years)
Principal Investigator	Dr. Neeraj Mehta, Ph.D. (Biomechanics & Alternative Medicine), Clinical Biomechanics & Research Ethics Certified (OHRP–HHS USA | ICMR India)
Collaborating Institutes	MMSx Authority Institute | BodyGNTX | GFFI India | IIKBS | BFS | AIHFT
Study Type	Prospective, observational intervention study
Study Duration	5 Weeks
Study Sites	BFS- and AIHFT-approved training & rehabilitation centers
IMSO Accreditation ID	[Insert IMSO Accreditation ID]

Version History Section

Version History:

- Version 3.0: Original draft, July 2025 (anticipated).

- Version 3.1: Minor updates for multi-site details, November 6, 2025.

- Version 3.2: Reviewed for ClinicalTrials.gov submission on November 25, 2025; no substantive changes to study design or methods.

- Version 3.3: Reviewed for ClinicalTrials.gov submission on 2025-12-08; no substantive changes to study design or methods.

2. About the BPIT Method (Revised)

Balanced Progressive Intensity Training (BPIT) is a biomechanical and physiological strength-training framework created by Dr. Neeraj Mehta. Its primary goal is to harmonize intensity progression, internal load distribution, and neuromuscular efficiency, thereby resolving the traditional training-injury paradox.

2.1. The BPIT 5-Line Principle

BPIT organizes all strength and movement exercises into five distinct intensity lines. Each line is defined by specific physical parameters, enabling a safe and structured progression from stability to power without generating overuse stress.

Line	Movement Base	Target HR (bpm)	Focus & Purpose	Examples
1 – Ground-Based	Floor / Low GRF	95-110	Core activation + breath stability	Plank, Crunch, Dead Bug
2 – Knee-Level	Supported / Moderate GRF	100-120	Joint centration & controlled press / pull	Bench Press, Seated Row
3 – Standing	Full Bodyweight	120-140	Alignment & Kinetic-integration chain	Squat, Deadlift
4 – Head-Level	Overhead / Elevated	140-160	Thoracic mobility & scapular control	Overhead Press, Lunge
5 – Plyometric	Dynamic Impact	160-180	Elastic power &	Jump Squat,

Line	Movement Base	Target HR (bpm)	Focus & Purpose	Examples
			injury resilience	Burpee, Box Jump

2.2. Biomechanical Framework

The BPIT methodology operates by balancing **mechanical stimulus \times biomechanical integrity \approx physiological recovery**, ensuring consistent adaptation. Key biomechanical control mechanisms include:

- Ground Reaction Force (GRF) management
- Joint-Load Distribution analysis
- Heart-Rate (HR) and Heart Rate Variability (HRV) Control

3. Study Objectives

1. Evaluate the effect of BPIT on movement efficiency, mobility, and load control.
2. Quantify biomechanical and neuromuscular changes across the 5-week period.
3. Observe individual variance in adaptation and note any mobility or postural deviations.
4. Identify early-stage indicators of overload to refine safety parameters.

4. Methodology

4.1. Design and Participants

- **Design:** Multi-site, prospective, real-world clinical observation.
- **Participants:** \geq 369 healthy adults (18-65 years).
- **Inclusion Criteria:** No acute injury / medically cleared for exercise.
- **Exclusion Criteria:** Chronic pathology, cardiac instability, recent surgery.
- **Sample size:** n=100 for 80% power (α=0.05, effect size=0.5 via G*Power 3.1), detecting moderate changes in MES/ROM with 10% dropout.
- **Control group:** Standard progressive overload training (no BPIT lines) for comparison.
- **Additional exclusions:** BMI >35, pregnancy, uncontrolled hypertension, or recent surgery (<6 months).

4.2. Procedure: 5-Week Progression

Week	Phase	Focus	Assessment Tool	Expected Outcome
0	Baseline Screening	Posture & Mobility	MMSx Flaw Checklist + BPIT Line Mapping	Establish Reference
1-2	Correction Phase	Stability & Joint Centration	Controlled Low-Load BPIT	\downarrow Compensation Patterns
3-4	Progressive Phase	Load Adaptation & Efficiency	Mid-Load BPIT	\uparrow MES & ROM
5	Evaluation Phase	Power Integration	Final BPIT Test + Clinical ROM	\uparrow Strength & Control

5. Data Collection Parameters

All data will be stored in the **BodyGNTX Research Registry** with anonymized codes.

Variable	Metric/Tool	Evaluator	Frequency
Movement Efficiency Score (MES)	BPIT Observation Scale 0-10	MMSx Expert	Weekly
Range of Motion (ROM)	Goniometer / Digital App	Assessor	Wk 0, 3, 5
Pain Scale (VAS 0-10)	Self-Report	Site Clinician	Weekly
Strength Index	Rep x Load Chart	Trainer	Wk 0, 5
Postural Symmetry	Video Analysis	Research Staff	Wk 0, 5

6. Ethical & Medical Oversight

- Study conducted per Declaration of Helsinki (2013) and WHO GCP guidelines.
- Participants must sign the official MMSx Informed Consent Form before initiation.
- Any participant showing adverse change in mobility, movement, or health status will be referred to a medical specialist.
- Oversight is provided by registered orthopedic and sports-medicine doctors under the **MMSx Clinical Board**.

7. Expected Outcomes (Prognosis)

BPIT is projected to validate the model as a safe and scientifically structured progression.

- Movement Efficiency Score improvement by \geq 25\%.
- ROM in major joints improvement by 15-20\%.
- Strength Index improvement by 20-30\%.
- Injury risk reduction by \geq 35\%.

8. Signatures

Role	Name / Institution	Signature	Date
Principal Investigator	Dr. Neeraj Mehta - MMSx Authority		2025-12-08
Site Expert / Clinician	[Name / Institution]		
Medical Observer / Orthopedist	[Name / Institution]		
IRB / Ethics Approval	[MACREB Chair Name]		

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