

# Exercise Holds Promise for Improving Memory and Learning in Psychosis

Early Results from HKU Clinical Research on Physical Exercise as Add-on Intervention Strategy to Medication  
Hong Kong Early Psychosis Intervention Society (EPISO) to Collaborate in Launching the *FitMind* Movement

**Professor Eric CHEN Yu-hai**  
Clinical Professor

Department of Psychiatry, The University of Hong Kong Li Ka Shing Faculty of Medicine  
Chairman, Hong Kong Early Psychosis Intervention Society

**Dr. Edwin LEE Ho-ming**  
Clinical Assistant Professor

Department of Psychiatry, The University of Hong Kong Li Ka Shing Faculty of Medicine

**Ms Joy KOK**  
Chief Executive

Public Awareness and Education Fund, Hong Kong Early Psychosis Intervention Society



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## Study Background

### What is psychosis?

- \* Psychosis refers to a set of symptoms that include hallucinations, delusions, and disorganised thoughts and speech.
- \* Psychotic disorders cause many dysfunctions including neurocognitive impairment (e.g., memory and learning), low motivation and social isolation.
- \* Psychotic disorders affects up to 2 in 100 people and are a leading cause of disability worldwide.



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## Study Background

### Treatment for psychosis:

- \* Medication controls psychotic symptoms but is less effective in treating the associated dysfunctions, which have widespread consequences in the patient's daily functioning and long-term outcome.
- \* Metabolic side-effects with medications, especially second-generation antipsychotics, are also a concern in many patients.
- \* Cognitive Remediation: it has been found some beneficial effect on cognition in psychosis, but it is apparatus and time demanding.



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## Effect of Aerobic Exercise on Cognition

- \* Research shows the effect of aerobic exercise on increasing the size of the hippocampus, an important brain area for memory, and on improving memory test results in healthy adults (Masley, et al., 2009), and in patients with other conditions such as depression (Kubesch, et al., 2003) and Alzheimer's disease (Lautenschlager, et al., 2008).
- \* Pajonk et al. (2010) found that short-term memory has significantly improved in chronic male schizophrenic group after a 12-week stationary cycling program.
- \* Medication is less effective in treating neurocognitive impairment, however based on previous research, physical exercise may be helpful.



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## Barriers to Physical Exercise in People with Psychosis

- \* Lack of knowledge
- \* Lack of interest
- \* Lack of motivation
- \* Lack of support
- \* Lack of facilities



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## Study Objective

- \* To investigate the potential of add-on physical exercise intervention as a non-invasive cognitive remediation therapy in patients with psychosis through a randomised clinical trial
- \* The first study worldwide to be done in patients with early psychosis to investigate the effectiveness of physical exercise as an intervention



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## Study Population

Identified patients from the Early Assessment Service for Young People with Psychosis (EASY) programme of the Hospital Authority (HA) who had:

### Inclusion criteria

- \* Diagnosed with schizophrenia and related disorders
- \* Females aged 18 to 55
- \* Had been ill for less than 5 years
- \* Fewer than 10 hours of vigorous aerobic exercise (equivalent to jogging at 10 km/hr) in the previous 3 months
- \* Cantonese-speaking Chinese
- \* Ability to understand the study and to give informed consent

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## Study Design

- \* This study was a randomised controlled trial of exercise intervention, with 12 weeks of follow up
- \* Patients were randomised into either of the 2 groups:
  1. Exercise group: receiving a 12-week exercise intervention added on to their current treatment
  2. Control group: continuing with their current treatment until after 12 weeks, which is also called a wait-list control group



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# Physical Exercise Intervention

During the 12-week period, those who are randomised to receiving exercise intervention undergo the below:

## Physical Exercise Intervention group

- 3 sessions of aerobic exercise training per week, with each session lasting 40-50 minutes (36 sessions in total)
- Including walking on a treadmill for 15 to 20 minutes, plus stationary cycling for 25 to 30 minutes
- Their heart rate is continuously monitored to achieve a moderate level of exercise exertion intensity



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# Assessments

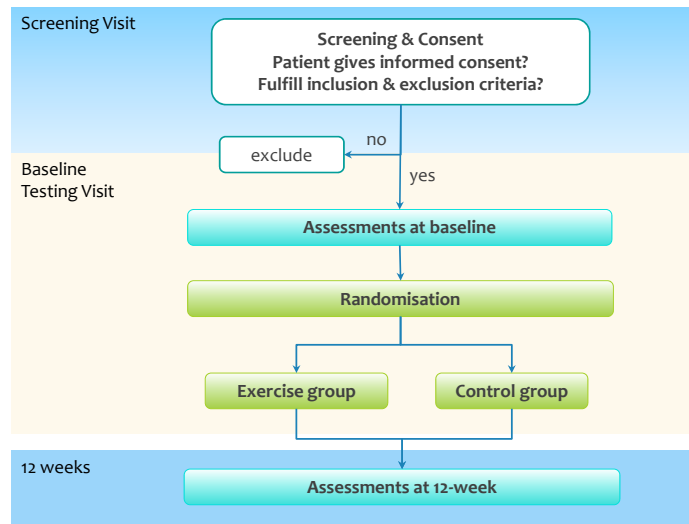
All patients were assessed with neurocognitive measures and physical fitness at 2 time points: (1) baseline and (2) 12-week

- **Neurocognitive functions**
  - Verbal memory acquisition and long term verbal memory were assessed with the Hong Kong List Learning Test (HKLLT)
  - IQ: WAIS information and digit symbol subtests
  - Cognitive flexibility: Stroop Test
  - Attention: Letter Cancellation Test



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## Summary for Study Design



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## Study Recruitment

- \* Recruitment since July 2010
- \* 35 subjects have completed 12-week study period.
- \* 17 subjects failed to complete the study.
  - \* Exercise group: 4 subjects relapsed, 4 subjects failed to continue due to long distance, and 3 subjects due to lack of time.
  - \* Control group: 1 subject relapsed, 4 subjects withdrew, and 1 subject lost contact.



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## Basic Demographics of Participants

The two groups were matched in age, education and duration of illness at baseline.

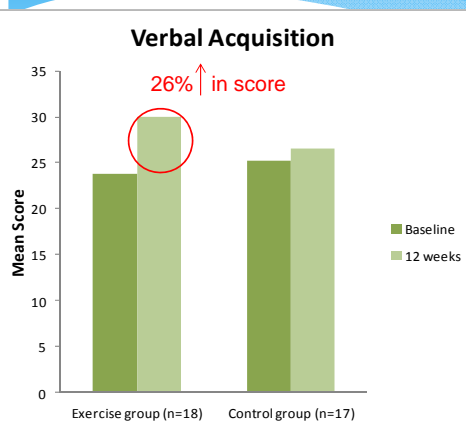
	Exercise group (n=18)	Control group (n=17)
Age (years)	23.71	23.71
Education (years)	13.50	12.93
Illness duration (years)	2.50	2.13



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\*mean

## Major Findings - Verbal Acquisition Improved in the Exercise Group



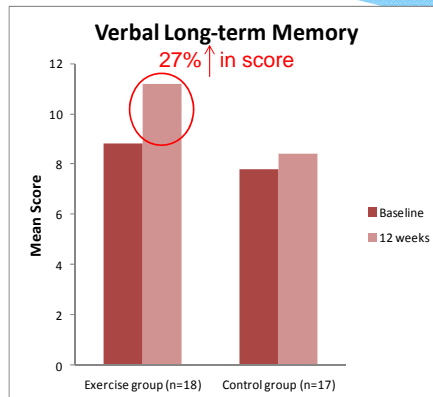
- \* A significant interaction between the time points (before and after 12 weeks) and study groups (with and without exercise intervention) were found ( $F=3.91 [2,53], p<.05$ ).
- \* Patients in the exercise group achieved an increase in mean score by **26% increase** (from 23.8 to 30.0 scores) in the learning test compared with only **6% increase** (25.2 to 26.6) in the waiting-list control group.

\*Note: The full score for verbal acquisition is 48. Ordinary people usually score 36.

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## Major Findings - Verbal long-term Memory Improved in the Exercise Group



- \* A significant interaction between the time points (before and after 12 weeks) and study groups (with and without exercise intervention) were found ( $F=3.52 [2,53], p<.05$ ).
- \* Patients in the exercise group achieved an increase in mean score by 27% (from 8.8 to 11.2 scores the memory test), compared only 8% increase (7.8 to 8.4) in the waiting-list control group.

15 \*Note: The full score for long term memory test is 16. Ordinary people usually score 13.4



## Conclusions

- \* While medication is ineffective in treating dysfunction in psychosis patients, aerobic exercise can reverse some cognitive deficits even in the early stage of psychosis.
- \* According to the research results, aerobic exercise improves verbal acquisition and long-term memory in patients with early psychosis.
- \* Physical exercise should be promoted to psychosis patients as an effective intervention to improve psychosis symptoms.



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## Background of *FitMind* Movement

- \* Although aerobic exercise can reverse some cognitive deficits in people with psychosis, there are many potential barriers to exercising in patients with psychosis.
- \* Medication controls psychotic symptoms but is less effective in treating these associated dysfunctions.

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## The *FitMind* Movement

To facilitate the promotion of physical exercise among psychosis patients and their healthy counterparts.

→ developed by Hong Kong Early Psychosis Intervention Society (EPISO) in collaboration with Department of Psychiatry of HKU LKS Faculty of Medicine



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## FitMind Movement

A comprehensive exercise movement tailored to the specific needs and ability of patients with psychosis.

### Barriers

Lack of access to resources



Lack of social / other support



Low motivation / interest



### FitMind characteristics

Provision of training materials (eg DVD), exercise movements that can be easily performed individually or with companions

Coaching system, peer support network from volunteers

Options of intensity level for an easy start with increments for motivation; fun and social elements to arose and sustain interest

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## Publicity Campaign

FitMind Charity Walkathon

Date: **March 18, 2012**

Venue: The Peak, Hong Kong

### FitMind 10 Movements

(link to video/live demonstration)

EPISO website: [www.episo.org](http://www.episo.org)

FitMind Campaign: [www.episo.org/FitMind.html](http://www.episo.org/FitMind.html)

### About Hong Kong Early Psychosis Intervention Society (EPISO)

- Founded in 2007
- Registered as a charitable institution in 2009
- Consists of experienced professionals, academics (including doctors / professors from the Department of Psychiatry of the HKU LKS Faculty of Medicine) and lay members in the field of early psychosis
- To make accessible knowledge and experience gained from research and clinical practice to promote:
  - high-quality early psychosis intervention services
  - professional training
  - public awareness programmes

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## *FitMind* Movement MTV

- \* EPISO website: [www.episo.org](http://www.episo.org)
- \* FitMind Campaign: [www.episo.org/FitMind.html](http://www.episo.org/FitMind.html)

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