บทความปริทัศน์ (Invited review article)

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บทคัดย่อ
"โฟกัส T25" เป็นโปรแกรมการออกกำลังกายระดับหนัก ผลิตโดยบริษัท ปิซซัลโด ซีชั่น โดย ชอน ที่ ซึ่งเป็นผู้สร้างโปรแกรม อินแซนิตี้ ที่เป็นที่นิยมอย่างมากเช่นกัน จากประสบการณ์การเดินน้อย "โฟกัส T25" เป็นโปรแกรมที่ใช้เวลา 25 นาที ที่มีการกระทำกายประมวล 5 นาที ภายหลังออกกำลังกาย ทั้งนี้ ซอน ที่ ใช้คำว่า "โฟกัส" มาหน้า เพราะเป็นโปรแกรมการออกกำลังกายที่เน้นทำและจังหวะของการออกกำลังกาย ที่ทำให้สร้างกล้ามเนื้อและลดไขมันได้มากที่สุด ในเวลา 25 นาที โดยสรุปแล้ว "โฟกัส T25" มีผลเพิ่มความแข็งแรง พลังและความอดทนของกล้ามเนื้อทั้งร่างกาย เพิ่มความอดทนของระบบหัวใจและระบบหายใจ เพิ่มความแข็งแรงสมดุลการทรงตัว ความยืดหยุ่น และการควบคุมอุณหภูมิได้มาก ดังนั้น "โฟกัส T25" จึงน่าจะมีบทบาทในการสร้างเสริมสุขภาพได้ อย่างไรก็ตามหากทำไปไม่ถูกวิธี อาจทำให้เกิดอันตรายได้ เพราะมีระดับการออกกำลังกายที่หนักมาก และมีการกระโดดต่อเนื่องกันเป็นเวลานาน หากกระทำไปไม่พร้อม ยอมทำให้ล้มเลื้อยและเจ็บป่วย เมื่อทำการเดินน้อย "โฟกัส T25" และข้อควรระวัง รวมทั้งการหยุดการออกกำลังกาย เพื่อให้ผู้ออกกำลังกายด้วยโปรแกรมการออกกำลังกายนี้ได้ประโยชน์อย่างเต็มที่โดยไม่เกิดอันตรายแก่ร่างกาย

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Physiological responses to “Focus T25”

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Abstract

“Focus T25” is a high-intensity exercise program. It is produced by beach body and led by world renowned personal trainer Shaun-T. Shaun-T was the program creator of the incredibly popular Insanity program which is a bit longer in duration. “Focus T25” takes around 25 minutes with 2-5 minutes of stretching after 25-minute workout. The word “focus” was used because Shaun T has chosen the most effective exercise combinations that will build and burn a large number of muscles and fat in the quickest time possible within 25 minutes. Overall, “Focus T25” increases muscular strength, power and endurance, cardiorespiratory endurance, speed, balance and flexibility. In addition, it improves body temperature regulation. Therefore, it could be benefit for health promotion. However, if we do it wrong we may get injury from its high intensity and jumping. If the exercisers are not fit enough we may experience muscle and tendon injuries, fatigue, joint pain, faint or heart failure. Beneficial physiological effects of “Focus T25” following by precaution and termination of the exercise are summarized. This may help exercisers gain full benefit from “Focus T25” with safety.

Keywords: high intensity exercise, strength, endurance, balance, weight reduction

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Introduction

At this moment in Thailand, there is no exercise program popular than “FocusT25” for anyone who loves the intense weight and cardio workouts. “Focus T25” is produced by beach body and led by world renowned personal trainer Shaun-T. Shaun-T was the program creator of the incredibly popular Insanity program which is a bit longer in duration. “Focus T25” takes around 25 minutes with 2-5 minutes of stretching after 25-minute workout. The word “focus” was used because Shaun T has chosen the most effective exercise combinations that will build and burn a large number of muscles and fat in the quickest time possible within 25 minutes. The exercisers do not stop once the DVD starts up.

However, “Focus T25” has two sides; benefit if we do it right but dangerous if we do it wrong. So I start from summarizing the beneficial physiological effects of “Focus T25” following by precaution and termination of the exercise. This may help exercisers gain full benefit from “Focus T25” with safety.

Beneficial physiological effects

World Health Organization recommended that vigorous-intensity activities at least 3 days per week; and activities that strengthen muscle and bone at least 3 days per week provides greater health benefit. “Focus T25” is a high-intensity exercise program. It involves high impact moves that engage all areas of exerciser’s core, major muscle groups like quadriceps, calves and hamstrings, trunk and the upper body. Overall, “Focus T25” increases muscular strength, power and endurance, cardiorespiratory endurance, speed, balance and flexibility. In addition, it improves body temperature regulation. Therefore, it could be benefit for health promotion.

In order to have these capacities, our bodies need energy supply. Only one molecule that can immediately provide energy is adenosine triphosphate (ATP). However, the body cannot easily store ATP (and what is stored gets used up within a few seconds), it is necessary to continually synthesize ATP during exercise.

Generally, the two major ways the body converts nutrients to energy are aerobic metabolism (with oxygen) and anaerobic metabolism (without oxygen). Carbohydrate (CHO) is the main nutrient that provides energy during a high-intensity exercise via anaerobic glycolysis or aerobic pathway, while fat can provide energy during a low-intensity exercise for long periods of time via aerobic pathway (Figure 2). Proteins are generally used to maintain and repair body tissues, and are not normally used to power muscle activity. However, Thai healthy sedentary subjects relied more on CHO than fat during all (Figure 3). The greater daily proportional CHO intake in Thai subjects than that in white subjects may be responsible for the greater CHO utilization. Thus, not only the intensity and duration of the exercise determine which method gets used but also the diet.

In addition, “Focus T25” is the program that follows the overload training principle. Anyone who cannot adapt to the program will fail to continue the training because he/she has muscle injury, illness, pain, atrophy, increased cortisol and decreased physical performance. However, anyone who can adapt to the program will gain benefits from the training. These include hypertrophy of muscle fiber type I and IIa because it plays important role during the high intensity exercise for nearly 30 minutes (Table 1). This contributes to improve performance (Figure 4). Left ventricle muscle mass and chamber volume are increased. Mitochondria content (Figure 5), size and function, fat utilization during the exercise was increased leading to CHO sparing. Faster duration rates of oxygen diffusion and fuel into muscle. Oxidative enzyme level and efficiency and disposal of metabolic waste were also increased. Cell regulatory mechanism of metabolism was improved. Moreover, the exercise training increases insulin sensitivity via 3 possible mechanisms (Figure 6): 1) increased glucose transporter 4 exocytosis from its vesicle 2) decreased glucose transporter 4 endocytosis and 3) increased glucose transporter 4 activity.
Table 1 Characteristics of skeletal muscle fiber types (modified from ref11)

<table>
<thead>
<tr>
<th>Features</th>
<th>Type I fibers</th>
<th>Type II a fibers</th>
<th>Type II x fibers</th>
<th>Type II b fibers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraction time</td>
<td>Slow</td>
<td>Moderately Fast</td>
<td>Fast</td>
<td>Very fast</td>
</tr>
<tr>
<td>Resistance to fatigue</td>
<td>High</td>
<td>Fairly high</td>
<td>Moderate</td>
<td>Low</td>
</tr>
<tr>
<td>Activity Used for</td>
<td>Aerobic activity</td>
<td>Long-term anaerobic activity</td>
<td>Short-term anaerobic activity</td>
<td>Short-term anaerobic activity</td>
</tr>
<tr>
<td>Maximum duration of use</td>
<td>Hours</td>
<td>Less than 30 minutes</td>
<td>Less than 5 minutes</td>
<td>Less than 1 minute</td>
</tr>
<tr>
<td>Power produced</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>Very high</td>
</tr>
<tr>
<td>Mitochondrial density</td>
<td>Very High</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Capillary density</td>
<td>High</td>
<td>Intermediate</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Oxidative capacity</td>
<td>High</td>
<td>High</td>
<td>Moderate</td>
<td>Low</td>
</tr>
<tr>
<td>Major storage fuel</td>
<td>ATP, Triglycerides</td>
<td>ATP, Creatine phosphate, glycogen</td>
<td>ATP, Creatine phosphate, glycogen (little)</td>
<td>ATP, Creatine phosphate</td>
</tr>
</tbody>
</table>

Figure 1: Energy pathway (modified from refs 4, 5)
Figure 2 Substrate utilization in trained white subjects (modified from refs 6-8).

Figure 3 Substrate utilization in healthy sedentary Thai subjects (modified from ref 10).
Faster diffusion of oxygen and fuel into muscle
Increased expression of fatigue-resistance of slow twitch muscle fibers
Increased mitochondrial function
Increased cardiac muscle mass
Increased left ventricular dilation and chamber volume

Influence of Exercise Bout Duration

Influence of Exercise Bout Intensity

Figure 4 Physiological changes from high-intensity exercise (modified from refs\textsuperscript{12,13})

Figure 5 Influences of exercise bout and duration and intensity on muscle fiber content (modified from ref\textsuperscript{15})
In addition, “Focus T25” is a successful program because it also encourages nutrition program. This controls balanced energy intake and expenditure. Nutritional “Focus T25” Meal Plan and a “Focus T25” 5 Day Fast Track meal Plan really keep it simple on what to eat and when to eat it. This helps the exercisers successful in gaining body shape and health.

**Precaution**

If the exercisers do it wrong such as performing without enough warming up or preparation (dress, shoes and food intake) or too much effort at the first start they may have muscle pain, fatigue or injury. They have to be careful about the jumping part by not jumping too high. This may prevent them from continuing the exercise.

In addition, the exerciser should stop the exercise if they have symptoms as recommended by the American College of Sport Medicine (ACSM).

**American College of Sport Medicine (ACSM) Indications for Termination of an Exercise Test**

These indications for termination of an exercise test consists of 2 categories; absolute and relative indications.

**Absolute Indications**

1. Suspicion of a myocardial infarction or acute myocardial infarction (heart attack)
2. Onset of moderate-to-severe angina (chest pain)
3. Drop in systolic blood pressure (SBP) below standing resting pressure or drop in SBP with increasing workload accompanied by signs or symptoms
4. Signs of poor perfusion (circulation or blood flow), including pallor (pale appearance to the skin), cyanosis (bluish discoloration), or cold and clammy skin
5. Severe or unusual shortness of breath
6. CNS (central nervous system) symptoms
e.g., ataxia (failure of muscular
coordination), vertigo (an illusion of
dizzying movement), visual or gait
(pattern of walking or running) pro-
blems, confusion
7. Serious arrhythmias (abnormal heart rhythms)
e.g., second / third degree AV block,
atrial fibrillation with fast ventricular
response, increasing premature ven-
tricular contractions or sustained ven-
tricular tachycardia
8. Technical inability to monitor the ECG
9. Patient’s request (to stop)

■ Relative Indications
1. Any chest pain that is increasing
2. Physical or verbal manifestations of shortness
   of breath or severe fatigue
3. Wheezing
4. Leg cramps or intermittent claudication
   (grade 3 on a 4-point scale)
5. Hypertensive response (SBP >260 mm Hg;
   DBP >115 mm Hg)
6. Pronounced ECG changes from baseline
   It is >2 mm of horizontal or down sloping ST-segment depression, or
   >2 mm of ST-segment elevation (ex-
   cept in aVR)
7. Exercise-induced bundle branch block that
cannot be distinguished from ventricular
tachycardia
8. Less serious arrhythmias (abnormal heart
   rhythms) such as supraventricular tachycardia

■ Keys for success with “Focus T25”
1. If you are older than 35 years old you should
   receive physical examination by a doctor
   before starting “Focus T25” program.
2. Start with active warming up and finish with
cold down by active stretching for at least 5
   minutes.
3. Following the DVD at your own pace and even
   stop exercising if you feel cannot perform it.
   This is important for injury prevention.
4. If you have muscle pain during the first
   few days, you should first use cold pack to
   alleviate pain and followed by massaging
together with hot pack.
5. Get some antioxidant or protein supplementa-
tion in the first 30 minutes to help with
   recovery.19-21

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