

臺北市立大學
110 學年度碩士班入學考試試題

班 別：運動健康科學系碩士班
科 目：運動健康議題（運動健身指導、運動傷害防護、運動健康科學研發）
考試時間：90 分鐘【08：30－10：00】
總 分：100 分

不得使用計算機 或任何儀具。

一、 申論題（請自申論題下列 3 題中自行選擇 2 題作答，若答題數超過 2 題，則以作答序較前之 2 題計算成績，每題 25 分，共計 50 分）

（一）肌少症為現今大家關注的健康議題，請就您所知盡可能詳盡說明肌少症的生理機制、評估方法，及預防、延緩、轉介或治療方式。

（二）最大攝氧量（maximal oxygen consumption）之生理學定義為何？並請說明長期耐力訓練是透過哪些生理適應反應來提高個體之最大攝氧量。

（三）請盡可能就您所知詳盡說明增生療法（prolotherapy）在運動傷害之應用，並說明應如何搭配運動治療或運動機能重建以增強其效應。

二、 文章賞析（請自本項下列 3 題中自行選擇 2 題作答，若答題數超過 2 題，則以作答序較前之 2 題計算成績，每題 25 分，共計 50 分）

請仔細閱讀下列文章或摘要，於答案卷以中文陳述文章或摘要之意涵

(一)

Physical Activity Level of Thai Children and Youth: Evidence from Thailand's 2018 Report Card on Physical Activity for Children and Youth

Background: While enabling and supporting factors have been in place to facilitate the pupils to be more active, only a fourth of Thai children have met the WHO recommendation.

Objective: This study aims to present the physical activity (PA) level of Thai children and youth, based on the indicators established by Active Health Kids Global Alliance's Report Card (RC).

Methods: The 2016 Thailand RC Survey and the 2015–2017 Thailand's Surveillance on Physical Activity (SPA) were employed for the analysis. PA of Thai children aged 6–17 years old was assessed in 9 aspects 1) Overall PA, 2) Organized Sports and PA, 3) Active Play, 4) Active Transportation, 5) Sedentary Behavior, 6) Family and Peers, 7) School, 8) Community and Environment, and 9) Government.

Results: Only 26.2% of Thai children and youth met the recommended level of 60 min MVPA. Boys are generally more active compared to girls in all age groups (34.9% versus 16.3%, respectively). Almost half had participated in organized sports and/or PA program, but only 8.7% of Thai children and youth engaged in unstructured/unorganized active play. The settings and source of influence indicators achieved better grades, shown by 71.0% of family members (e.g., parents, guardians) facilitated PA and sports opportunities for their children.

Conclusion: Although schools' facilities are available, Thai curriculum provides less opportunity for the children to move during classes and have

enough playing time during recess. As there is no standardized guidance for PA in Thai schools, Thailand needs to promote a unified PA in order to improve PA and to reduce recreational screen time of children and youth.

文獻來源：*Journal of Exercise Science and fitness*.2021, 19(2), 71–74.

<https://doi.org/10.1016/j.jesf.2020.11.002>

(二)

Physiological Effects of Beetroot (甜菜根) in Athletes and Patients

Background

Dietary supplementation with beetroot juice (BRJ), a naturally rich source of nitrate, is an area of considerable interest to elite athletes as well as recreational exercisers. Nitrate and nitrite have previously been thought of as mainly final elimination products of nitric oxide (NO), but this view has been challenged and evidence indicates that these compounds can be converted to NO in vivo. We conducted a narrative review summarizing the literature regarding evidence of beetroot used as dietary supplement and its effects on training physiology and athletic performance in healthy and diseased populations. The databases PubMed and Web of Science were used to obtain articles. It was evident that BRJ supplementation had an effect on oxygen cost and consumption during exercise by more efficient adenosine triphosphate (ATP) production in combination with lower ATP consumption. However, the effect seems to be dependent on dose and duration. Effect on exercise performance is conflicting, time to exhaustion seems to increase but its effect on time-trial performance needs further elucidation. Ergogenic benefits might depend on individual aerobic fitness level, where individuals with lower fitness level may gain higher

benefits regarding athletic performance. Dietary nitrate supplementation appears to have some effect on training performance in patients with peripheral artery disease, heart failure, and chronic pulmonary obstructive disease. However, larger randomized controlled trials are necessary to determine the overall utility of beetroot as a dietary supplement.

文獻來源: *Cureus*. 2019, 11(12):e6355. doi: 10.7759/cureus.6355.

(三)

Contralateral Effects by Unilateral Eccentric versus Concentric Resistance Training

Background

Muscle strength increases not only for the trained muscle but also in the contralateral, nontrained homologous muscle (同源肌肉) after unilateral resistance training, which is known as the cross-education effect (對側交叉保護效應). Munn et al. showed that the average magnitude of cross-education effect from the trained to nontrained limb muscle strength was 35% (95% confidence interval, 20.9% ~ 49.3%). In a recent meta-analysis study of cross-education effect based on 96 studies, Green and Gabriel reported that cross-education effect was present similarly between upper- and lower-limb muscles, and between sexes, and that the magnitude of increase in muscle strength of the nontrained limb was 18% in young adults, 17% in older adults, and 29% in patients with neuromuscular disorders. They also showed that the magnitude of the cross-education effect among nonclinical populations (the ratio between the nontrained and trained muscle strength gain) ranged from 48% to 77%. If such cross-education effect can be maximized, it could be used more effectively for

rehabilitation, such as minimizing atrophy and strength loss of immobilized limb and enhancing recovery from injury.

文獻來源：*Med. Sci. Sports Exerc.*, Vol. 52, No. 2, pp. 474–483, 2020.