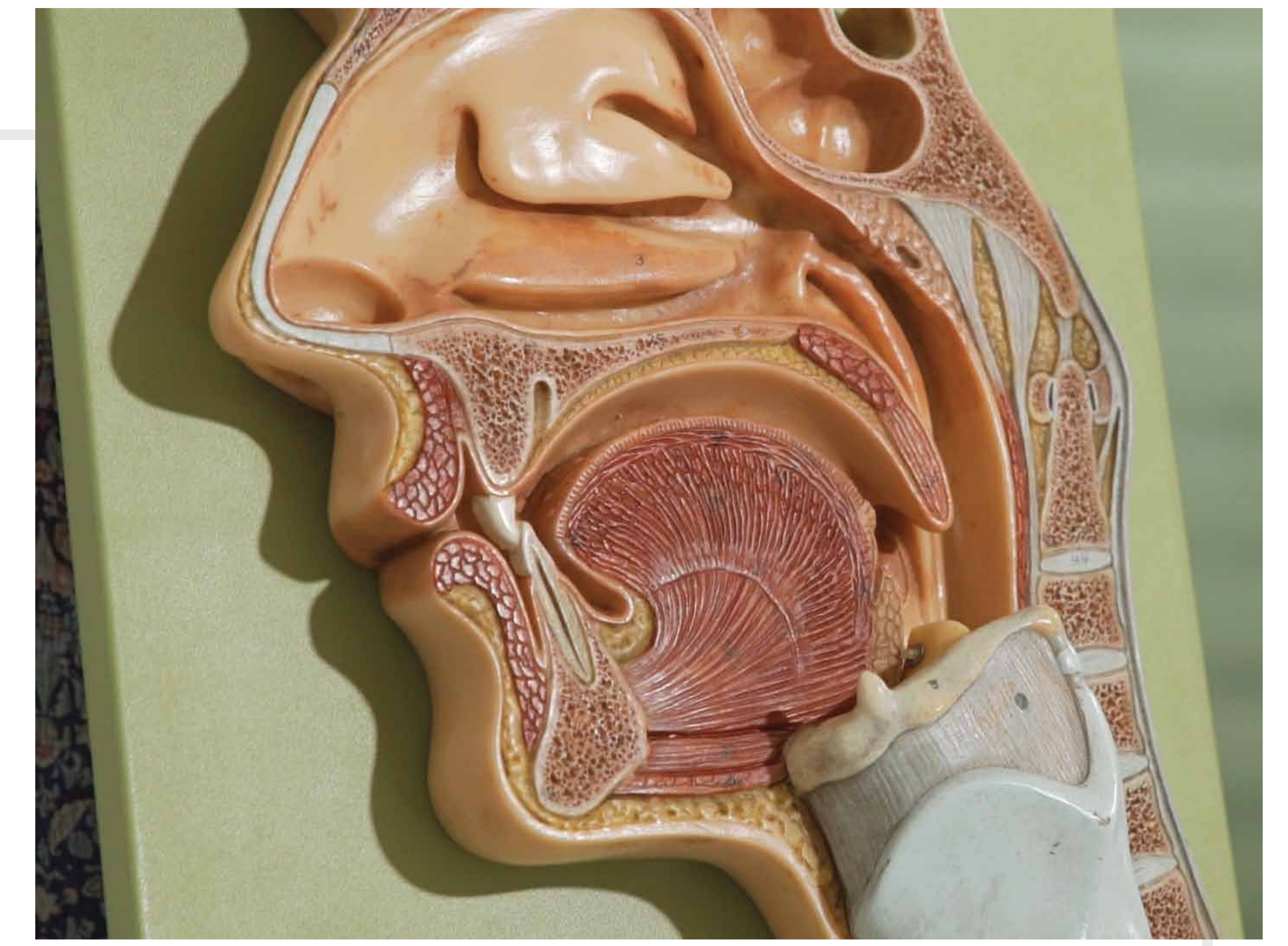




Technology-based Management of Swallowing Difficulties

We are developing technology-based solutions to increase the awareness of carers and the general public about management of swallowing difficulties in the elderly, and to provide alternatives to treat swallowing difficulties.



THE NEED

Very few of us may be aware of the importance of swallowing when we are eating and drinking. However, swallowing difficulties may cause some food, liquid, or medicine, to go through our trachea instead of the esophagus, causing choking or even respiratory complications.

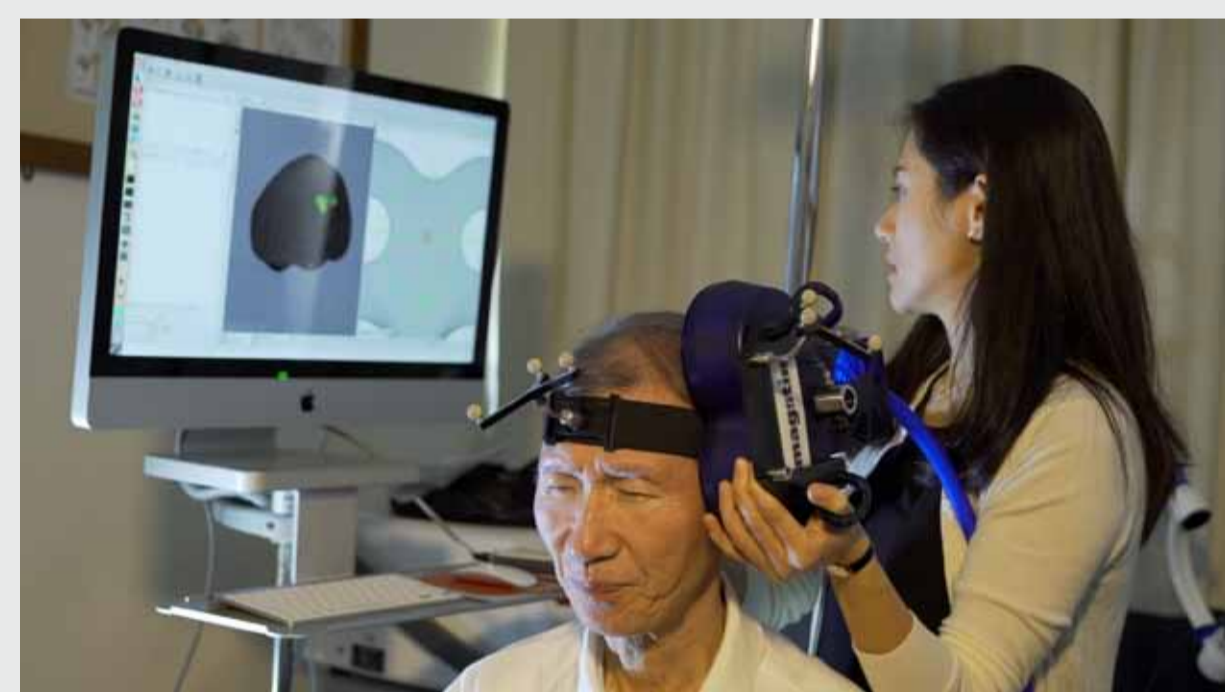
Our swallowing function changes with age. Elderly people need longer time for processing of food, longer transit time through throats, and have weaker esophageal function. An HKU research team, led by **Dr Karen Man Kei Chan**, Assistant Professor in the Division of Speech and Hearing Sciences, Faculty of Education, found that approximately **60%** of the elderly in nursing homes and **40%** of the elderly in day care centres have been suffering from **swallowing difficulties**, i.e. dysphagia. Many elderly people also have difficulty in communicating their swallowing difficulties to their carers. Furthermore, most carers such as frontline staff and relatives of the residents in those nursing homes and day care centres **lack knowledge and skills** in swallowing management.

Patients suffering from stroke, Parkinson's Disease, dementia or head and neck cancer may also suffer from dysphagia. Elderly people with dysphagia are at high risk of malnutrition, dehydration, and reduced quality of life.

TECHNOLOGY-BASED SOLUTIONS FOR IMPROVEMENT

In order to increase public awareness about dysphagia management and to look for alternatives to treat swallowing difficulties in the elderly, the research team has been working on the following:

- **KOTE** – A mobile app, 'Keep On Talking and Eating (KOTE)', is being developed to provide a self-help platform to people who have or are at risk of developing progressive neurological and/or radiation-induced swallowing and communication difficulties. The app contains useful information about swallowing and speech disorders, and features videos and audio clips of evidence-based oro-motor muscle strengthening exercises that could be done during swallowing rehabilitation.



- **Repetitive Transcranial Magnetic Stimulation (rTMS)** – rTMS is the use of electro-magnetic induction to induce current onto the brain, which is generally used in treatment for psychiatric disorders to stimulate nerve cells in the brain. The research team has been studying since 2011 the application of rTMS to improve the function of stroke patients' mouth and throat muscles so as to ease their swallowing difficulties.

- **Acupuncture** – There are multiple studies that have demonstrated positive treatment effects of using acupuncture in dysphagia management. Numerous acupuncture methods, such as body acupuncture, scalp acupuncture and tongue acupuncture, were reported to be effective in treating dysphagia. However, most of these studies either lacked objective outcome measurements or did not include pre- and post-assessment comparisons. The research team is therefore planning to conduct prospective, randomised and double-blinded studies with objective outcome measures in future.



EXPECTED BENEFITS

The KOTE app is developed because only very few resources are available in educating and raising awareness of swallowing and communication difficulties in the Cantonese-speaking population in Hong Kong. For example, many post-irradiated nasopharyngeal cancer patients are often unaware that motor speech and swallowing side effects can arise from radiotherapy. As a result, they may not know how to access precautionary methods to prevent radiation-induced complications. It is hoped that the KOTE app will **help enhance swallowing safety and communication between patients and their carers**.

The team's research on using rTMS and acupuncture has potential to maximise the swallowing functions of patients by directly stimulating the affected brain regions and muscles. The ultimate goal is to **develop evidence-based clinical solutions** to treat swallowing problems in the elderly and to reduce medical and societal costs on managing complications resulting from poor swallowing management, which will eventually improve the quality of life of the elderly.

FIND OUT MORE

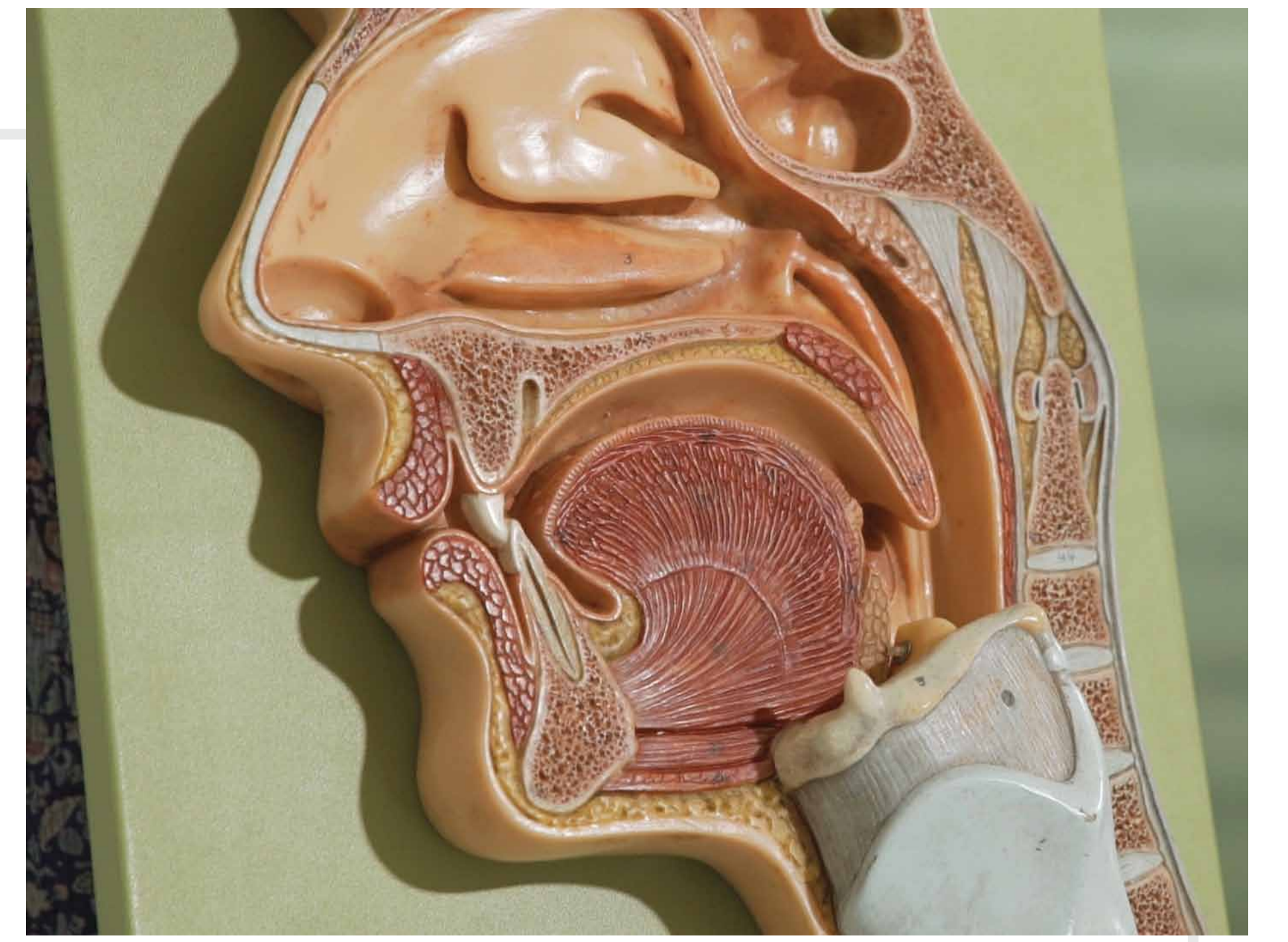
Swallowing Research Laboratory: <http://www.speech.hku.hk/clinic/swallowing/>





以科技為本處理吞嚥困難的方法

我們正在研發以科技為本的解決方案，以提高護理者和公眾對處理長者吞嚥困難的認識，並提供治療吞嚥困難的替代方案。



當前需要

一般人很少會意識到吞嚥在吃喝時的重要性。吞嚥困難的患者可能會錯誤把食物、液體或藥物吞進氣管而不是食道，引致窒息甚至呼吸道併發症。

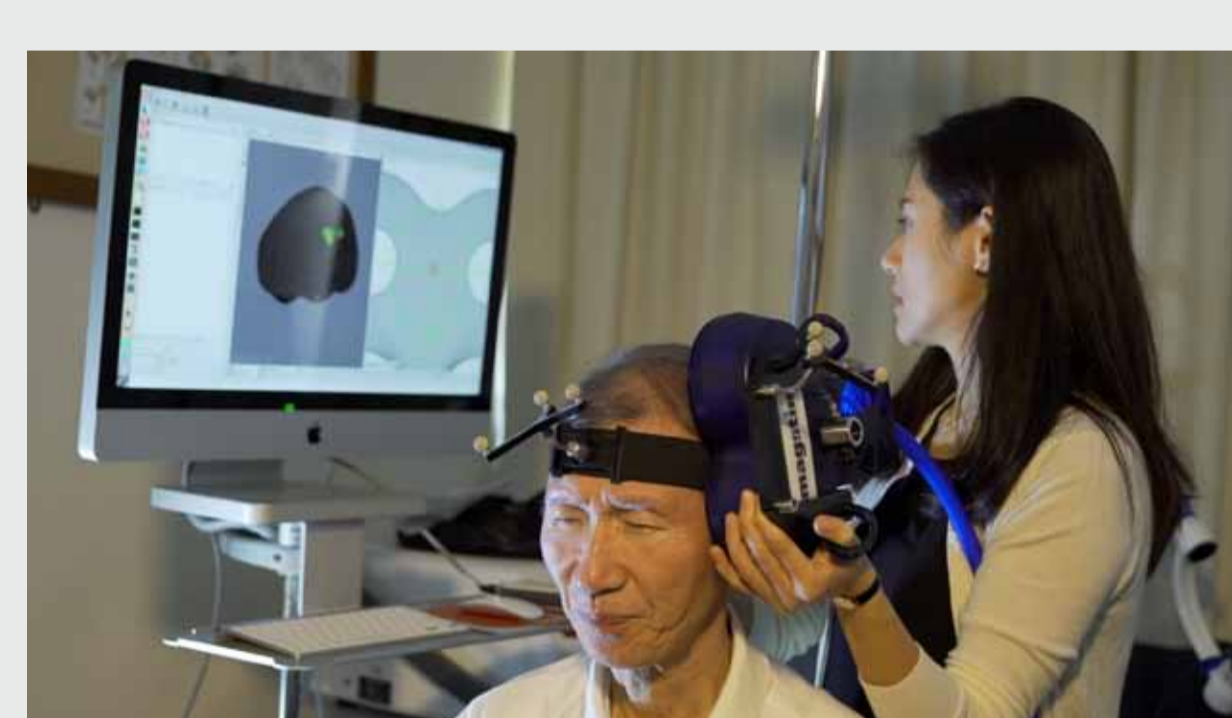
我們的吞嚥功能會隨年齡而變化。長者需要較長時間處理食物，食物經過喉嚨的時間較長，食道功能亦較弱。由香港大學教育學院言語及聽覺科學部助理教授**陳文琪博士**領導的研究團隊發現，約有**60%**療養院的長者和**40%**日間護理中心的長者都有**吞嚥困難**，很多長者亦難以將自己的吞嚥困難告知他們的護理人員。此外，大多數護理者，包括在療養院和日間護理中心的前線護理人員以及長者的親屬均**缺乏處理吞嚥問題的認識和技巧**。

患有中風，帕金森症，腦退化症或頭頸部癌症的病人也有可能吞嚥困難。患有吞嚥困難的長者會有較大機會出現營養不良、脫水和生活質素下降的情況。

以科技為本的治療方案

為了促進公眾對處理吞嚥問題的認識，並尋求治療長者吞嚥困難的替代方法，研究團隊致力發展以下項目：

- **KOTE** – 團隊正在開發名為「食多啲、講多啲」(‘Keep On Talking and Eating’ [KOTE]) 的手機應用程式，提供自助平台，幫助因患有神經系統疾病和 / 或接受放射治療而引致吞嚥和溝通困難的病人，以及面對有關風險的人士。應用程式包含有關吞嚥和言語障礙的資訊，以及提供視頻和音頻剪輯，教導患者在吞嚥康復期間可進行的口部肌肉強化練習，那些練習的效用均經過科研實証。



- **重覆高頻透顱磁場刺激療法 (rTMS)** – rTMS是使用電磁感應來誘導電流到腦部，刺激腦細胞，一般用來治療精神疾病。研究團隊自2011年以來一直致力研究rTMS的應用，幫助中風患者改善口腔和咽喉肌肉的功能，從而舒緩他們的吞嚥困難。

- **針灸** – 多項研究顯示使用針灸對治療吞嚥困難有正面的效果，亦有報告指出多種針灸方法，包括身體針灸、頭皮針灸以及舌針療法都有助治療吞嚥困難。然而，這些研究大多缺乏客觀的結果測量，或者不包括評估前後的比較。因此，研究團隊正計劃於未來進行前瞻性的隨機雙盲並兼具客觀結果測量的研究。



預期效益

研究團隊開發KOTE應用程式，是因為現今香港只有極少資源教育和提高粵語社群對吞嚥困難和相關溝通問題的意識。例如，很多接受放射治療後的鼻咽癌患者一般都不為意言語和吞嚥的障礙可能是放射治療後的副作用。他們因此可能不懂得採取措施來預防輻射誘發的併發症。團隊希望透過KOTE應用程式，**幫助增強患者與護理者的溝通及公眾對吞嚥安全的認知**。

透過直接刺激受影響的大腦區域和肌肉，rTMS和針灸的應用有可能協助患者盡量運用他們的吞嚥功能。研究團隊的目標是**開發以科研實証為本的臨床解決方案**，治療長者的吞嚥困難，並減少因吞嚥問題處理不當而造成併發症的醫療及社會開支，從而提高長者的生活質素。

了解更多

吞嚥研究所：http://www.speech.hku.hk/clinic/swallowing/hcvc_c.html

