（一）課程主題摘要內容(限 200 字內)

主講題目	**Survey of Molecular Mechanisms of Hyperbaric Oxygen in Orthopedic Tissue Repair**
摘要內容	Hyperbaric oxygen (HBO) has been used for a variety of indications involving tissue repair for many years. These indications comprise a wide range of diseases ranging from intoxications to ischemia-reperfusion injury, crush syndrome, central nervous injury, radiation induced tissue damage, burn injury and chronic wounds. Recently, a wide range of different molecular mechanisms influenced by HBO have been defined. They can be grossly grouped into five basic categories: transcription, vascular signaling and stress, vascular adhesion, cell-to-cell contacts and structure, inflammation, well as apoptosis, autophagy and cell death. Depending on the various indications and underlying diseases, respectively, different arrays of mechanisms seem to be at work. By analyzing 20 experimental papers published by Chang Gung Memorial Hospital HBO Lab, we established an overview of the current concepts regarding the molecular mechanisms underlying the effects of HBO in orthopedic tissue repair, including bone, cartilage, and intervertebral disc (IVD). We considered both the abovementioned pathways and their role in various applications and indications.

課程主題摘要內容(限 200 字內)

主講題目	高壓氧在運動醫學的應用
摘要內容	Hyperbaric oxygen therapy (HBOT) is the administration of 100% oxygen breathing in a pressure vessel at higher than atmospheric pressure (1 atmosphere absolute = 101 kPa). Typically, treatment is given daily for between one and two hours at pressures of 2.0 to 2.8 ATA, depending on the indication. Sporting injuries are often treated over 3-10 sessions. HBOT has been documented to be effective and is approved in 14 medical indications by the Undersea and Hyperbaric Medical Society (UHMS), including but not limited to: carbon monoxide poisoning, compromised skin grafts and flaps, crush injuries, necrotizing soft tissue infections, and non-healing ulcers with arterial insufficiencies. Recently, HBOT for sports musculoskeletal injuries is receiving increased attention. HBOT may allow injured athletes to recover faster than normal rehabilitation methods. Any reduction in collegiate and professional athletes' rehabilitation period can be financially significant for top-level sports teams.

課程主題摘要內容(限 200 字內)

課程主題	The Scope of Research in Hyperbaric Oxygen Therapy 高壓氧治療研發之展望
摘要內容	高壓氧治療的臨床自 1970 年代中期年開始在台灣應用於潛水後減壓症、慢性皮膚潰瘍、慢性骨髓炎等疾病。因為臨床應用的推展和治療機轉的探討，歷經半世紀年全世界普遍推廣此項治療，迄今已擴展應用到臨床上十餘種疾病，成為一項很好的輔助治療，台灣也由早期的兩、三家醫院擴張到所有的醫學醫院和各大小醫院診所，而全台高壓艙數目也增加到兩百多台。 因為分子生物科學的進步，對臨床上治療的原理有了一些進一步的了解，甚或推翻了一些傳統的觀念，茲例舉幾項重要且有趣的研究。另外科學家發現雖然各類疾病因及病生理的發展不盡相同，高壓氧常有著相類似的治療機轉，甚至完全相反的治療方法，譬如「低壓-低氧」和「高壓-高氧」對動物竟有著相同的保護和治療機轉。 傳統上，當病患的體溫超過 38℃會被列為高壓氧治療的禁忌症，就一定不能接受高壓氧治療，因為怕體溫太高，增加體內的氧化壓力，高壓氧會導致氧氣中毒，引發痙攣或抽搐等神經系統中毒。 奇美醫院環境暨高壓氧研究室和腦心血管實驗室團隊著手探討高壓氧對於實驗性熱中暑之療效。將大白鼠暴置於一個 43℃之環境中約 70 分鐘引發熱中暑來模擬高燒及重症多重器官衰竭的狀況，然後立即給予 2.5 大氣壓純氧高壓氧治療一小時。根據先前多項實驗結果，我們發現大白鼠誘發熱卒中時會出現與人類相似的症狀：低動脈壓、顱內壓高、腦缺血、神經細胞損傷、有害神經傳導物質、肝及腎功能異常、凝血功能異常等。以上熱中暑大鼠所表現的症狀皆可因爲高壓氧治療而獲得極大的改善，生存時間大幅延長，此時過氧化氫及 TNF-α之上昇幅度亦獲得有效減緩。此一系列相關的研究成果發表於國際重症醫學雜誌(2005)和歐洲藥理學雜誌(2007，2007，2009)， 並且成功的用於臨床熱中暑的病例，發表於中國生理學雜誌。在高燒及多重器官衰竭的狀況下經由動物實驗証明適當的高壓氧不但不會增加氧化壓力，可能經由抑制發炎反應對心臟血管系統、腦神經、肝臟、凝血功能有保護作用，同時腦中的有害神經傳導物質、多種氧游離基增加的幅度也大為減少。由於我們對高壓氧減輕氧化壓力機轉的瞭解和成功的治療了重症熱中暑病患，讓我們對相關重症疾病的高壓氧治療更具信心，而且處理上有更多的彈性。 在高壓氧前處理的研究分面，奇美醫院的研究團隊對引發高山症的動物模型實施「低壓-低氧」和「高壓-高氧」兩個環境完全相反的實驗，希望能觀察對高山症的影響，並作機轉的探討，第一個實驗是「高壓-高氧前處理」(Hyperbaric oxygen preconditioning, HBO PC)將動物置於高壓艙內先予以大白鼠 2 ATA 高壓氧 5 小時每天一次連續五天，另外一個實驗是「低壓-低氧前處理」（Hypobaric Hypoxia Preconditioning, HH PC ），即將動物置於減壓艙內將之抽真空到 0.66 ATA，相當於 3500 公尺的高山，停留 5 小時，每日一次每周五天，連續兩周。然後兩組前處理的動物各別減壓到 6000 公尺 (0.47ATA) 的高度 24 小時，引發高山症。結果發現死亡率和症狀都減輕，而且經過分析看到兩組的腦神經系統的氧化壓力、發炎指數和熱休克蛋白-70 都有效的下降，這兩個「低壓-低氧」和「高壓-高氧」完全相反的前處理對動物高山症的發生都發揮預防保護的功能，而且其保護機制有共同點，因此

	具創意刊登於的國際醫學期刊 J Trauma. (2011)，The Journal of Science (2013)， Biomed Res Int. (2018)。 **結論**：經過全球科學家和臨床醫師共同的努力，高壓氧的治療已由早期的提昇組織含氧量、改善血液循環、恢復新陳代謝、促進傷口癒合及組織修復，到如今已進入到健康促進預防保健和再生醫療的領域。

課程主題摘要內容(限 200 字內)

主講題目	Real-world effectiveness of hyperbaric oxygen therapy for delayed neuropsychiatric sequelae after carbon monoxide poisoning
摘要內容	為了評估高壓氧療法(HBOT)對一氧化碳中毒後延遲神經精神後遺症(DNS)的真實世界有效性，我們從 2009 年至 2015 年，對台灣最大的醫學中心-林口長 庚醫院的一氧化碳中毒患者進行了回顧性評估。 在 466 位一氧化碳中毒的患者中有 62 位出現了 DNS，其中 11 位完全恢復。預測 DNS 改善的可能因素包括發生 DNS 後，早期接受 HBOT 的治療(72.7%vs 25.5 %; P = 0.006)，以及在急性 CO 中毒期間接受超過三次 HBOT 的治療(81.8%vs 27.5 %； P = 0.003)。在 CO 中毒後發生 DNS 的患者早期 HBOT 的治療，顯著改善了 DNS 症狀，並且持續一年的治療效果。 結論 目前，DNS 治療仍未達成共識。我們的研究發現，在發生 DNS 的患者中，急性中 毒階段接受超過三次 HBOT 的治療患者在隨後的神經精神後遺症方面具有更好的 預後。此外在 DNS 發生後三天內開始 HBOT 的治療，能顯著改善 DNS 的症狀

(二)課程主題摘要內容(限200字內)

主講題目	Combined Acupuncture-Hyperbaric Oxygen-Steroids Therapy for Idiopathic Sudden Sensorineural HearingLoss: A Retrospective Observational Study
摘要內容	**Background:** Several management options are available for patients with idiopathic sudden sensorineural hearing loss (ISSNHL). Pharmacologic treatments tend to be the first choice and may include a variety of combination of steroids, plasma volume expander, and vasodilators. However, the therapeutic effects are controversy. Hyperbaric oxygentherapy (HBOT) thus evolved to be an alternative. In this presentation, we investigated the therapeutic effect between pharmacologic agent (steroid and dextran) and the addition of HBOT. **Methods:** This retrospective chart review enrolled 619 patients who met the ISSNHL criteria and were categorized into three groups according to the different treatment regimens. Among these patients, 396 underwent steroid therapy only (S) group, 186 received steroid and HBOT (S-H) group, and the remaining 37 were treated with combined acupuncture-HBOT in addition to steroid therapy (S-H-A) group. The outcome was determined by comparing the differences in pure-tone thresholds and absolute hearing gains after treatment calculated at each audiometric octave frequency or grouped frequencies of audiograms. Hearing recoveries classified into three grades: complete, partial, and poor were also analyzed and compared among different treatment groups. **Results:** The S-H-A group exhibited good hearing improvement outcomes at each audiometric octave frequency and grouped frequencies of audiograms, with greater hearing gain and had more favorable outcomes in hearing recovery grades compared with the S group and the S-H group. **Conclusions:** The results obtained in this study revealed a preliminary finding of ISSNHL patients benefiting from combined acupuncture, HBOT, and conventional steroid therapy. HBO and Acupuncture is a safe and nonpharmacologic treatment option that would be beneficial for patients with initial profound ISSNHL. It is recommend to start as early as possible with therapy, preferably within 48 h and to use this combination therapy.

課程主題摘要內容(限 200 字內)

主講題目	**不止促進傷口癒合;高壓氧在燒傷的應用**
摘要內容	疤痕神經性疼痛在燒燙傷後的患者身上是常見的現象，現有的止痛藥物效果不良，還可能有副作用的問題。另一方面燒燙傷還會造成肌肉的萎縮，使患者肌力變差，回歸正常生活與工作的難度變高。 在本研究使用史道二氏大鼠來建立足底皮膚三度燙燒傷引發神經性疼痛與肌肉萎縮的動物模組，將實驗動物放入高壓氧治療艙接受高壓氧治療後，藉由腳底觸覺測定儀測定其疼痛反應，並測量腳部抓力。後續利用組織切片染色確定足底疤痕組織變化及相對應的皮節脊髓之微小膠質細胞的活化情形，發現高壓氧治療可以改善行為疼痛反應與減低微小膠質細胞活化，及減少腓腸肌萎縮的程度，恢復腳部抓力，得知高壓氧治療可以改善神經性疼痛與肌肉萎縮。

課程主題摘要內容(限200字內)

主講題目	Wound healing is perfusion: management of ischemic ulcer/gangrene and venous ulcer
摘要內容	慢性困難癒合傷口是門診相當常見的,但是如何符合value-based health care (value=outcome/cost)的要求，則須每位患者深入了解其傷口形成的原因，針對主要的病理生理(pathophysiology)的矯正，才能充分發揮高壓氧輔助治療的功效。

（二）課程主題摘要內容（ 限 200 字內）

主講題目	AI-assisted Organization of the Integrated Wound Care Center
摘要內容	**Purpose:** To manage of the different kinds of wounds in hospitalized patients is challenging. The passive receiving the consultation requests were widely used in almost all hospital. The delay management was commonly found. To build to a specific wound care team and direct involve to all wounded patients are necessary. We utilize the modern artificial intelligent to create a wound map system to achieve a epoch-making change and improvement. **Materials and Methods:** Since June, 2020, the **wound care map** of integrated burn and wound care center was built up at Shuang-Ho Hospital. The integrated wound care services was given for all hospitalized patients. The concepts of "advance deployment" were created in our professional team of wound care. Until this May, the almost 1,000 patients enrolled our map for wound care. The details of map creation, patient care, satisfaction and outcome analysis were performed this this study. **Results:** The 972 patients were collected in the first year. The first seven commonly wounds were noted. The four suggestions were provided after our wound intervention during patient visit. During the pre-consultation period, the all patients with surgical indicated were identified and get the earlier intervention. The good satisfaction and outcome will be reported. **Conclusion:** According to the routinely wound care policies in every hospital, the wound care initiation no longer started by passive consultation. Alternatively, the active, direct identify all hospitalized patients with wound care necessity from the new-created wound care map. The modern artificial intelligent wound care concepts will become the new model in Taiwan, even whole world.