

APLS

兒科急診醫學

The Pediatric Emergency

Medicine Resource Revised 4th Edition

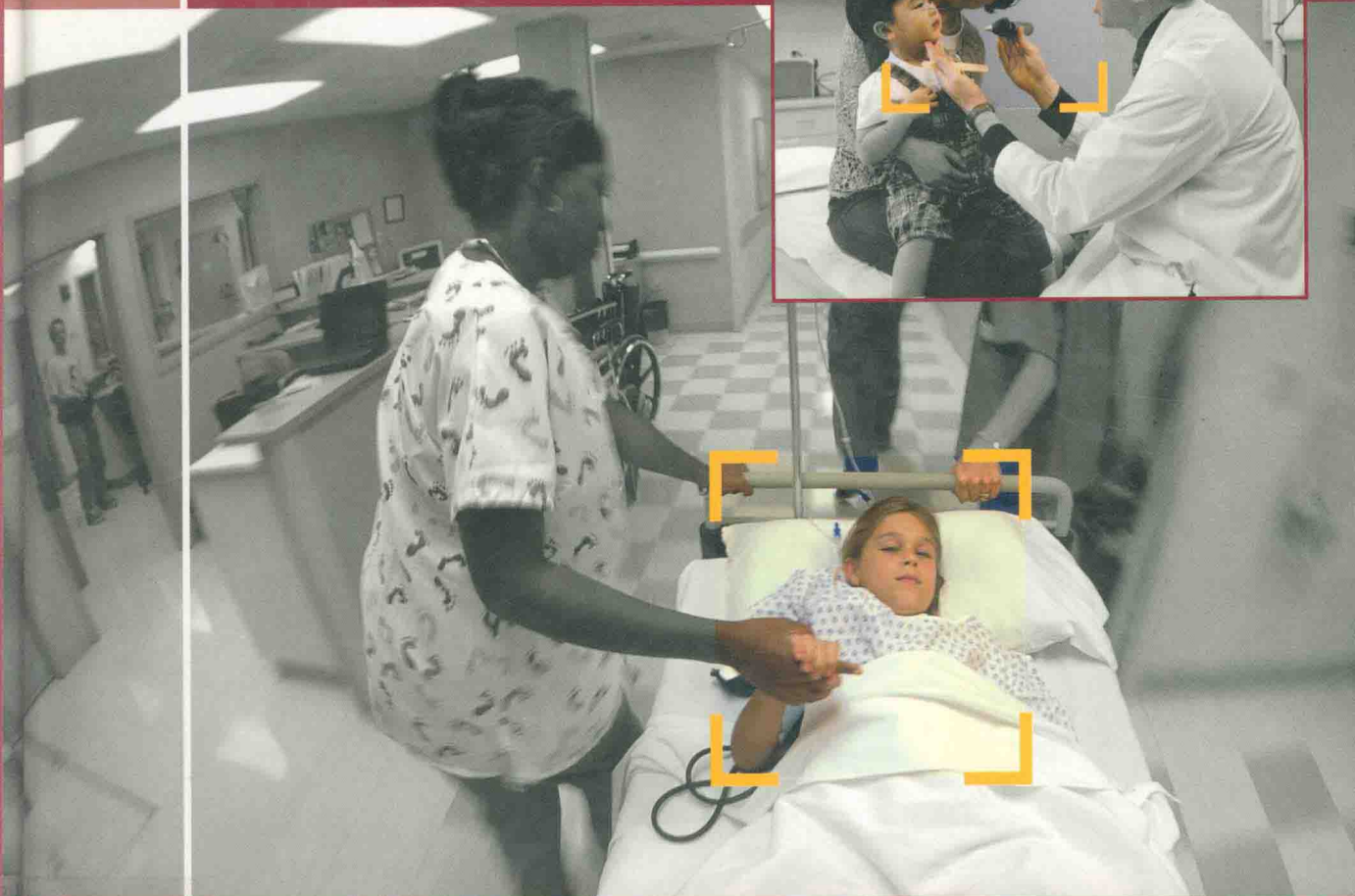
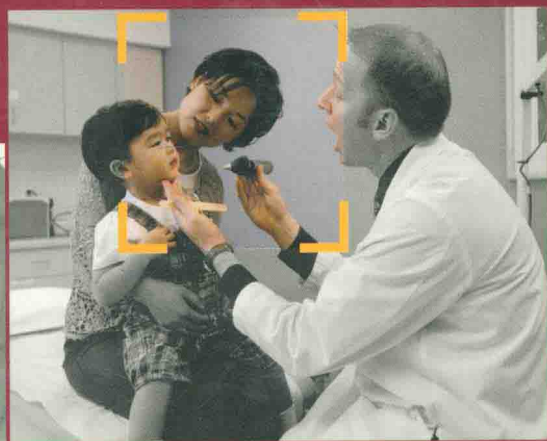
符合 2005 年
國際心肺復甦術
最新標準

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兒科急診醫學

醫師在處理病症緊急情況時，相當耗費精力的，且在當下必須保證醫療處理最完整可靠的參考書，可讓醫師做好充分準備來因應各種

十五年之前，美國兒科醫學會及美國急診醫學會合作，致力於發展「先進兒科生命支持(Advanced Pediatric Life Support)」課程，又稱為APLS。時至今日，已經提供醫師在評估與照顧重症或受創傷病童來到急診或門診時，在知識與資訊。

這些長期累積下來的豐富資料，給予急診醫師、小兒科醫師及其他專業的醫護人員一個完整兒科急診醫學的知識脈絡。每個章節或是教育單元都是先舉一個案例，然後闡明評估、診斷、檢查、治療及後續處置的關鍵重點。每個章節同時會列出參考文獻、有用的圖表、照片和圖解，以及醫學繼續教育 (CME) 選擇題，來測試讀者對於該章節的了解程度。

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Dr. Martha Jane Smith Bushore-Fallis

1970年代後期，美國俄亥俄州哥倫布兒童醫院的Bushore-Fallis醫師，找了Jerry Foster醫師合作，整合了參與兒童急診照護的相關醫療人員，開始建立對話、溝通彼此關切的議題，並設立相關目標。由他們開始，讓美國小兒科醫學會(American Academy of Pediatrics)成立急診部門。當Bushore-Fallis醫師擔任召集人時，她熱誠的領導大家在這個「新」領域建立標準課程。

秉持著這個概念，Bushore-Fallis醫師的團隊在沒有額外資源支持與缺乏標準臨床指引的情況下，從他們自己數年來教導學生的教材開始整理與撰寫。當他們完成後，運用一些計畫經費，將此課程出版。之後就獲得美國小兒科醫學會與美國急診醫學會(American College of Emergency Physicians)的認證與推廣。

在1983年，關於兒童急救與生命照護方面的教育(Pediatric Life Support Education)發展成兩個小組。一組成為美國心臟醫學會(American Heart Association)兒童急救委員會(Subcommittee on Pediatric Resuscitation)，專注於兒童急救，發展出兒童進階急救(Pediatric Advanced Life Support, PA會)課程。另一組則是兒童危急情況的辨認與處置穩定小組，則成立

APLS聯合作小組(現在已經改為APLS指導委員，負責發展APLS課程。)

第一個APLS課程是在1984年舉辦。經過五年持續的努力之後，APLS：兒科急診醫學課程的學生手冊出版。Bushore-Fallis醫師就是第一版的編輯委員。第一版是1989年出版，第二版是1993年，第三版是1998年，全部都是APLS聯合作小組完成，都建立在Bushore-Fallis醫師與其同事們的紮實基礎上。

Bushore-Fallis醫師於1999年退休，她曾經在University of Tennessee Hospital and East Tennessee Children's Hospital, both in Knoxville, Good Samaritan Hospital in West Palm Beach, Florida, Emory University School of Medicine (multiple sites) in Atlanta, St. Joseph Hospital, Tampa, and Bayfront Hospital, St. Petersburg等醫院，服務病童長達三十年。她現在與她先生一小兒外科Jim Fallis醫師，居住在美國佛羅里達州Clearwater及加拿大多倫多二處。

APLS指導委員會，編輯與各作者將此第四版獻給Bushore-Fallis醫師，以感念她的遠見與努力，讓APLS課程可以成真。對於Bushore-Fallis醫師來說，永遠都是「為了兒童而做」，對於接續她任務的我們來說，也將是我們永遠的信念。

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APLS：兒科急診醫學的第四版，代表整個課程內容與範圍的重要擴展。原先早期課程設計，是爲了提供給不常照顧兒童的急診醫護人員重要的醫療常識與做法；現在，則是要提供給所有照顧兒童急診的任何醫護人員一個參考的重要資源。這一點在 *APLS* 指導委員會的目標任務裏，有很清楚的描述：

美國小兒科醫學會與美國急診醫學會所組成的 *APLS* 指導委員會要將原先的 *APLS* 課程轉化爲兒科急診繼續教育的重要參考資料。第四版的課程將核心轉爲彈性化、模組化的兒科急診醫療資訊來源。

這個最新的教育課程不只是傳統的二天密集課程，也包括一天的濃縮課程，提供重點內容的密集訓練。而這也是首次，提供一定期限的課程訓練完成證書，給成功完成整個課程的學員。

兒童急救教育的重要核心爲兒童評估三角 (Pediatric Assessment Triangle)，這是由 Pediatric Education for Paramedics (PEP) 課程首先發展出來的，後來由 Pediatric Education for Prehospital Professionals (PEPP) 課程再加以修訂而來的。兒童評估三角提供給兒科急診醫療專業人員一個易記、可靠的結構化方式，在緊急情況下，立即初步評估兒童準確的病情或受創處。

拿「描寫精采」、「文筆流暢」、「大受歡迎」，來形容一本著作，不免陳腔爛調；但本書的內容及生動性，是名符其實的佳作。現在文件需要能繼續跟上時代觀念的變化，是很重要的目標，所以 *APLS*

指導委員會因此希望利用現代科技，提供隨時更新的線上資源。要達成這個目標，需要每個成員的積極參與。各位的回應對於 *APLS* 指導委員會非常重要，可以經由網路即時提供兒科急診醫學的最新而正確的觀念。現在就能掌握未來，不管在哪裡、何時，或如何學習，都可經由電腦取得最正確的資訊。

非常感謝第四版的編輯與作者群。主要編輯有 Marianne Gausche-Hill 醫師、Susan Fuchs 醫師與 Loren Yamamoto 醫師，還有 Francois Belanger 醫師、Arthur Cooper 醫師、Michael Gerardi 醫師、Daniel Isaacman 醫師、Anna Jarvis、Robert Wiebe 醫師等人的幫忙。編輯群受到許多專家的指導，包括美國小兒科醫學會的 Robert Perelman 醫師、Linda Lipinsky 與 Eileen Schoen，以及美國急診醫學會的 Michael Gallery、Thomas Werlinich 與 Marta Foster。特別感謝兩個醫學會的理監事，能有遠見支持 *APLS* 指導委員會的作法，以及跟 Jones and Bartlett Publishers。同時要感謝 Jones and Bartlett Publishers 的 Kimberly Brophy，他努力提升品質，讓學習教材的成爲全新的兒科急診醫學教育課程模範。

兒童是我們最寶貴的資源，也是我們未來之所繫。我代表 *APLS* 感謝大家願意花費心神來學習，如何將急診兒童的健康照顧得無微不至。

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October 2003

自從美國小兒科醫學會與美國急診醫學會推出首版APLS：兒科急診醫學以來，許多醫療原則已經出現變化。經由APLS聯合工作小組與委員會許多專家、編輯、課程主辦者與指導員持續的努力，讓整個課程更豐富，累積更多資料。這個努力仍然持續進行中，並在APLS指導委員會決定完成「摘星計畫」，將APLS塑造成為兒童急診醫學的完整知識寶庫，而達到全新的巔峰。

第四版APLS不只是一個課程而已，還符合兒科急診醫療專業人員需要的參考資料。它不是上完課，就丟在架子上的課程講義，而是嶄新詳盡的兒科急診醫學參考書籍。新的第四版APLS，全彩印製，比起前一版增加三倍以上的重要內容，全書採用模組化課程的彈性內容來呈現，讓人很方便作為手邊的參考文獻。這些內容花了兩年的持續努力與大約五十位編著者來撰寫。

本書只是兒科急診醫學教育學習系統的一部分。其他還包含APLS指導員參考光碟，裏面有簡報、二十個模組課程的講義、影像與表格資料庫、各種技術操作的教學注意事項、與其他教學輔助內容。這

些都是讓使用者很容易應用的電子格式，可以方便的置入個人簡報內容中，作為教學之用。

以前APLS都是設計成二日的課程，新版則設計不同的二日課程，內容可視需要彈性調整（包含PALS的再認證課程）；另外，還有一日課程（配合自學課程）。完成這些課程，就能取得新的APLS證書。測驗方面還有網路資料可供參考(www.APLSonline.com)，以及可以取得美國醫學繼續教育學分。

不論是APLS指導員或是住院醫師指導者，APLS指導委員會讓第四版符合大家的需要，可以將APLS教材當作課程手冊、參考書籍、演講講義或是技術操作指引。第四版的APLS：兒科急診醫學是為您學習參考而設計的，讓兒童健康福利銘記在心。

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Editors
October 2003

當 APLS：兒科急診醫學在 2003 年出版時，APLS 指導委員會已經預計，將來會需要適時推出修訂版，以應付新資訊與治療指引的出現。這個時機在 2005 年 11 月時出現，因為美國心臟醫學會推出新的心肺復甦術原則，所以決定修正教材內容，以符合 2005 年的國際心肺復甦術最新標準，包含新的心律不整與心肺停止急救流程圖。這個修正版也剛好讓我們有機會，詳細檢視所有內容，更新章節內容、更正內文錯誤，以及換上一些新的圖片，把 2006 年以後的新資料加入本書。

你手上閱讀的教科書是修訂第四版 APLS，正是依照上面所提及的修正方式來完成的。它是整個完整的教育學習系統之一部份。不論你是在急診，還是在門診或診所診間，APLS 教育學習系統是個精彩的課程，讓醫師了解如何評估及照顧嚴重疾病或受傷的兒童。這本書另外有 APLS 指導員參考光碟，可以從美國小兒科醫學會、美國急診醫學會以及 Jones and Bartlett 出版公司取得。光碟裏有 29 個簡報，每個皆附有講義、影像與表格資料庫、各種技術操作的教學注意事項、與其他教學輔助內容。這些都是讓使用者很容易應用的電子格式，可以很容易置入個人簡報內容中，作為教學之用。本書作為那些光碟資料的參考，提供 22 章包含兒科急診醫學的所有重要內容。

以前 APLS 都是設計成二日的課程，新版則設計不同的二日課程，內容可視需要彈性調整（包含 PALS 的再認證課程）；另外還有一日課程（配合自學課程）。完成這些課程，就能取得新的 APLS 證書。

還有新的網路資料可供參考 (www.APLSonline.com)，它增加了一些新的內容，包括 APLS 個案簡報，加強書籍已經提供的知識；APLS 社群 (Community)，是個公佈欄讓大家可以發問或提出評論的網路園地，所有問題是由 APLS 指導委員會委員來回答的；APLS 知識檢測 (Check your knowledge)，讓醫療專業人員易於進入網路學習模組與獲取美國醫學繼續教育學分。

不論是 APLS 指導員或是住院醫師指導者，APLS 指導委員會讓 APLS 教育學習系統符合大家的需要，可以將 APLS 教材當做課程手冊、參考書籍、演講講義、或是技術操作指引。修訂第四版的 APLS：兒科急診醫學是為您學習參考而設計的，讓兒童健康福利銘記在心。

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Editors

May 2006

翻譯這本書的緣起是來自我參加了2003年在美國紐奧爾良舉行的美國小兒科醫學會年會，舉辦了美國第一次新版APLS教育課程，親自接受APLS指導委員會委員的教導，那時我正在美國波士頓兒童醫院進修。那時發現他們對於兒科急診醫學努力推廣的概念，深覺感動。也跟他們談過翻譯引進國內的心願，他們也很高興能與我們分享，並答應讓我們翻譯成中文版，讓更多對兒科急診醫學有興趣的醫護同仁，能輕鬆的吸收最新的兒科急診醫學資訊。

我也因此瞭解了APLS與PALS這兩個相似的名詞，代表的是兩種很重要但不同的教育模式與學習目標。APLS重視的是兒科急診時遇到的各種常見與緊急的醫療狀況如何處理，教材詳實而有豐富的參考資訊，非常注重疾病鑑別診斷與分析。而PALS則是專心處理兒童急救的心肺復甦術，所以課程以清楚有條理的急救內容為重，注重如何在緊急時能有正確有效即時的處理急救流程。

從課程的對象與內容規劃來說，所有照顧兒童的醫護人員都應該要接受與完成PALS的訓練。而兒科急診的醫護專業人

員應先完成PALS課程，再接受APLS訓練課程（可同時再認證PALS證書）。這兩種課程目標與教學內容並不相同，目前國內的訓練課程常將二者合併，須特別注意如何達到兩種課程皆有效的教學目標，讓學員都能夠紮實的應用於臨床實際情況。

本書修正第四版原文長達八百多頁，所以特地請台大醫院急診醫學部劉越萍主治醫師與我一起合作翻譯主編，邀請台大醫院小兒部與急診醫學部多位相關兒童醫療專家各負責其專精的題目，為國內重量級的兒童醫學翻譯陣容。感謝大家在繁忙的臨床工作之餘，撥空努力為本書做詳實的翻譯，也感謝台大醫院小兒部王景甲醫師額外幫忙許多連絡事務。能把美國小兒科醫學會與美國急診醫學會合作的重要教育課程APLS：兒科急診醫學清楚完整的呈現在國內讀者的面前，希望讓國內的兒科急診教育更容易、更紮實而成功，讓我們大家一起來關心守護兒童的健康。

呂立

小兒胸腔加護醫學科主任
台大醫院小兒部

編輯感謝 Benjamin K. Silverman 醫師的指導與前兩版的執行編輯，以及他對整個第四版的努力及深度檢視校閱。

同時也要感謝所有先前 APLS 聯合工作小組成員的努力。許多之前的版本內容成為奠定第四版 APLS：兒童急診醫學的重要內容，也啟發了 APLS 指導委員會的成立。



紀念

James S. Seidel, MD, PhD, FAAP

1943.6.24-2003.7.25

APLS 課程的編輯要表彰 Seidel 醫師一生對於兒科急診醫學的貢獻。他是老師、科學家、兒童福利捍衛者，與許多人心目中一位很棒的朋友。他的睿智、擇善固執、對於正確事情的決心與執著，令人欽佩。這些特質中領著他把一生都貢獻給兒科急診醫學。性格領引他對於兒科急診醫學一輩子的重要貢獻。他是原來 APLS 工作小組的一員，也因此成為兒科急診醫學教育的先鋒。

Seidel 醫師贏得許多榮譽，其中包括 Outstanding Teacher Award from Harbor-UCLA Medical Center (1994); Section on Pediatric Emergency Medicine, American Academy of Pediatrics Outstanding Service Award (1994); Los Angeles County EMS Agency Award for Contributions to the Development of EMS in LA County (2000); and the EMS-C National Hero Award for Lifetime Achievement in Emergency Medical Services for Children, maternal and Child health Bureau HRSA/ National Highway Traffic Safety Administration (2000)。許多獎項也是用 Seidel 醫師的名字來命名，例如針對兒科急診醫學研修醫師的傑出研究所頒發的 Ambulatory Pediatric Association Ludwig-Seidel Award，美國小兒科醫學會急診部門的傑出服務獎，還有哥倫比亞 Cali 的 Universidad de Valle 有一間教室也以他命名，來表彰他對於國際兒童急救的教育貢獻。

Seidel 醫師，兒科急診醫學因您的出現而更豐富與進步，更重要地是因您的努力，拯救了許多兒童的寶貴生命。您的一輩子真是太精彩了，我們向您致敬，也永遠感念您。

Preparedness for Acts of Nuclear, Biological, and Chemical Terrorism

Objectives

1. Distinguish signs and symptoms of common childhood illnesses from those caused by biological agents.
2. Formulate a treatment plan for children exposed to chemical agents.
3. Discuss short-term and long-term effects of radiation exposure in children.

Introduction

- Smallpox
- Plague
- Botulism
- Tularemia
- Viral Hemorrhagic Fevers
- Chemical Agents
- Nerve Agents
- Vesicant Agents
- Cyanide
- Radiation Exposure
- Early Recognition



CASE SCENARIO

You receive a call from paramedics who are bringing in many students from a nearby school. The students are complaining of burning eyes and throat pain.

1. What agents are most likely to cause these symptoms?
2. What type of decontamination is needed?
3. What do you tell parents?

Introduction

The tragic events of September 11, 2001, and the subsequent outbreak of mail-borne anthrax cases have escalated concern among pediatricians and related child health professionals regarding possible acts of terrorism directed against children. An emerging threat is terrorism using weapons of mass destruction (WMD), or "unconventional threats," including those due to biological, chemical, and radiation exposures. Numerous reviews and consensus documents have discussed the

and a summary of nuclear and radiological exposures⁸ have been published. In addition, several relevant Internet Web sites have been developed to provide a more detailed description of individual agents and up-to-date management advice (Table 1b).

Epidemiology of WMD Terrorism

Most authorities expect that a terrorist attack with biological or chemical agents would utilize an aerosol route of exposure. A radiolog-

YOUR FIRST CLUE

Signs and Symptoms of Legg-Calvé-Perthes Disease

- Knee pain
- Limp
- Shortened limb
- Limited range of motion of the hip



Figure 12.10 Anteroposterior radiograph of Legg-Calvé-Perthes disease.

Clinical Features

Clinical symptoms in patients with LCP disease typically include pain and/or limp in the affected extremity. Similar to patients with slipped capital femoral epiphysis (SCFE), symptoms can be referred to the groin, thigh, or knee. Therefore, any child presenting with knee pain should have a thorough examination of the hip. A history of minor trauma frequently brings the chronic symptoms to medical attention but is not the cause of the symptoms. Contributives can be due to pain, limb length discrepancy, or to a limited range of motion at the hip. The examination should include gait, limb length measurement, and range of motion at the hip. Limited internal rotation and abduction at the hip joint is frequently found.

Diagnostic Studies

The diagnosis of LCP disease is confirmed with anteroposterior and frog-leg lateral pelvis radiographs.¹² Initially, the femoral head appears smaller and the articular cartilage space appears wider than the contralateral normal side. Within several months, a crescent-shaped radiolucent line can be seen on the lateral radiograph ('crescent sign'). This is caused by subchondral collapse of the trabecular bone. Later, the femoral head develops a fragmented appearance and is less radiopaque (Figure 12.3a). Reossification then takes place, but a residual deformity in the femoral epiphysis and acetabulum can persist.

Differential Diagnosis

The differential diagnosis of Legg-Calvé-Perthes disease includes other entities that present with

THE CLASSICS

Radiographic Signs of Legg-Calvé-Perthes Disease

- joint space widening
- Crescent sign
- Fragmentation
- Flattening of femoral head (coxa plana)

WHAT ELSE?

Differential Diagnosis of Legg-Calvé-Perthes Disease

- Developmental dysplasia
- Transient synovitis
- Fracture
- Tumor
- Slipped capital femoral epiphysis

knee or hip pain in children, including septic arthritis, transient synovitis, fractures, malignancies, and SCFE.¹² Although SCFE usually presents in older children, there is overlap of age presentations between 10 and 13 years. Radiographs should easily distinguish these

情境案例 (Case Scenario)：每一個章節包含許多模擬個案，這些個案要促使讀者思考遇到類似情況時如何處理。每個章節最後會有情境案例的總結。

首要線索 (Your first clue) : 列出最重要的臨床症狀。

典型診斷 (The Classics) : 列出最重要的診斷標準。

疾病鑑別 (What else?): 列出其他最重要的疾病鑑別診斷。

and the pain can be reproduced by having the patient extend the knee against resistance or by squatting with the knee in full flexion. History usually reveals that running, going up and down stairs, and jumping cause increased pain.

Diagnostic Studies

The diagnosis of Osgood-Schlatter disease is usually clinical. Radiographs are frequently obtained to rule out other conditions, including neoplasm, cysts, infections, stress fractures, and other musculoskeletal diseases involving the knee. Although a lateral knee radiograph might reveal a fracture through the tibial tubercle, frequently only soft tissue swelling is seen. Some patients who present with radiographic fragmentation of the tubercle will develop chronic symptoms. Those with no fragmentation are usually asymptomatic at long-term follow-up.⁴⁰

Management

Management of patients with Osgood-Schlatter disease is almost always nonsurgical and depends on the extent of the presenting symptoms.⁴⁰ Patients with mild symptoms should be given nonsteroidal anti-inflammatory drugs

and be advised to avoid activities that cause repeated quadriceps contraction. For many adolescents, the latter advice is frequently hard to follow. Symptoms usually improve in weeks to months. More advanced cases can be treated with a knee immobilizer (and, rarely, a cylindrical cast). Steroid injections are not indicated. Rarely patients with uninvolved lesions will require surgery directed at excision of all the intratubercle ossicles and possible removal of the tibial tubercle.⁴⁰ In most patients, the condition is self-limiting and results in no long-term complications.

Summary

The approach to children with orthopedic complaints should be based on age, history of symptoms, and physical findings. Causes of nontraumatic orthopedic conditions vary significantly with age, and a complete history and physical examination will be necessary to exclude systemic disease.

KEY POINTS

Management of Osgood-Schlatter Disease

- Mild to moderate symptoms
 - Nonsteroidal anti-inflammatory agents
- Moderate to severe symptoms
 - Knee immobilizer or cylindrical cast
- Very severe cases
 - Surgical intervention (rare)

THE BOTTOM LINE

- Causes of nontraumatic orthopedic emergencies vary with patient age.
- Obtain a complete history to include character, location, quality, and time course of symptoms.
- Determine if the condition is associated with an acute traumatic event or repetitive activity.
- Always examine the hips in any patient with knee pain.
- Radiographs might be needed to establish the diagnosis.
- Foreign cartilage or primary bone referral is necessary.

Summary

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處置要點 (Key points) : 列出最重要的處理步驟。

學習重點 (Bottom line) : 總結章節重要概念。

CHAPTER REVIEW

Check Your Knowledge

- A biological weapons attack would most likely resemble which of the following mass casualty emergencies?
 - Earthquake
 - Large bomb blast
 - Release of chlorine from a train wreck
 - Severe influenza epidemic
 - Tornado
- Which of the following syndromes is common to most of the high threat biological agents?
 - Characteristic rash
 - Encephalopathy
 - Feverish prodrome
 - Pneumonia
 - Renal failure
- Distinguishing features of botulism from other causes of paralysis include which of the following?
 - Hallucinations
 - High fever
 - Intact sensation
 - Normal bulbar function
 - Severe paresthesias
- Which of the following patients poses the least potential hazard to health care providers?
 - An adolescent with untreated pneumonic plague
 - An asymptomatic adolescent with mumps agent on skin
 - Children exposed to high doses of ionizing radiation
 - A child with fever and extensive lesions of smallpox
 - An infant with nerve agent on clothing

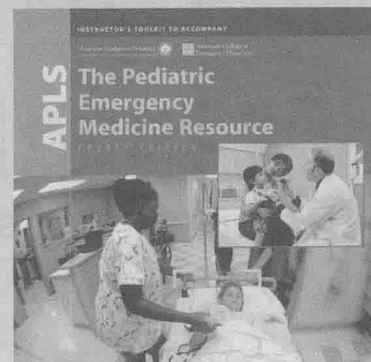
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Chapter Review

自我評量 (Check your knowledge) : 章節末提供題目，以作為自我評估。



指導員參考光碟

07637-45928

利用此光碟，可讓準備課程更方便，裏面包含：

投影片簡報：提供簡報內容，可讓教育學習更有效，而這些簡報內容可視需求來調整。

演講講義：提供演講用的提示內容，也可依據自己的需求來調整。

影像資料庫：提供本課程重要的影像，可供使用者自行用來插入簡報、做講義，或是放大作進一步討論。

表格資料庫：提供本課程各式表格作參考。

行政資料與格式、技術操作要點

還有許多有用資訊可作參考。

(APLS指導員光碟，可以從美國小兒科醫學會、美國急診醫學會以及 Jones and Bartlett 出版公司取得。)

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