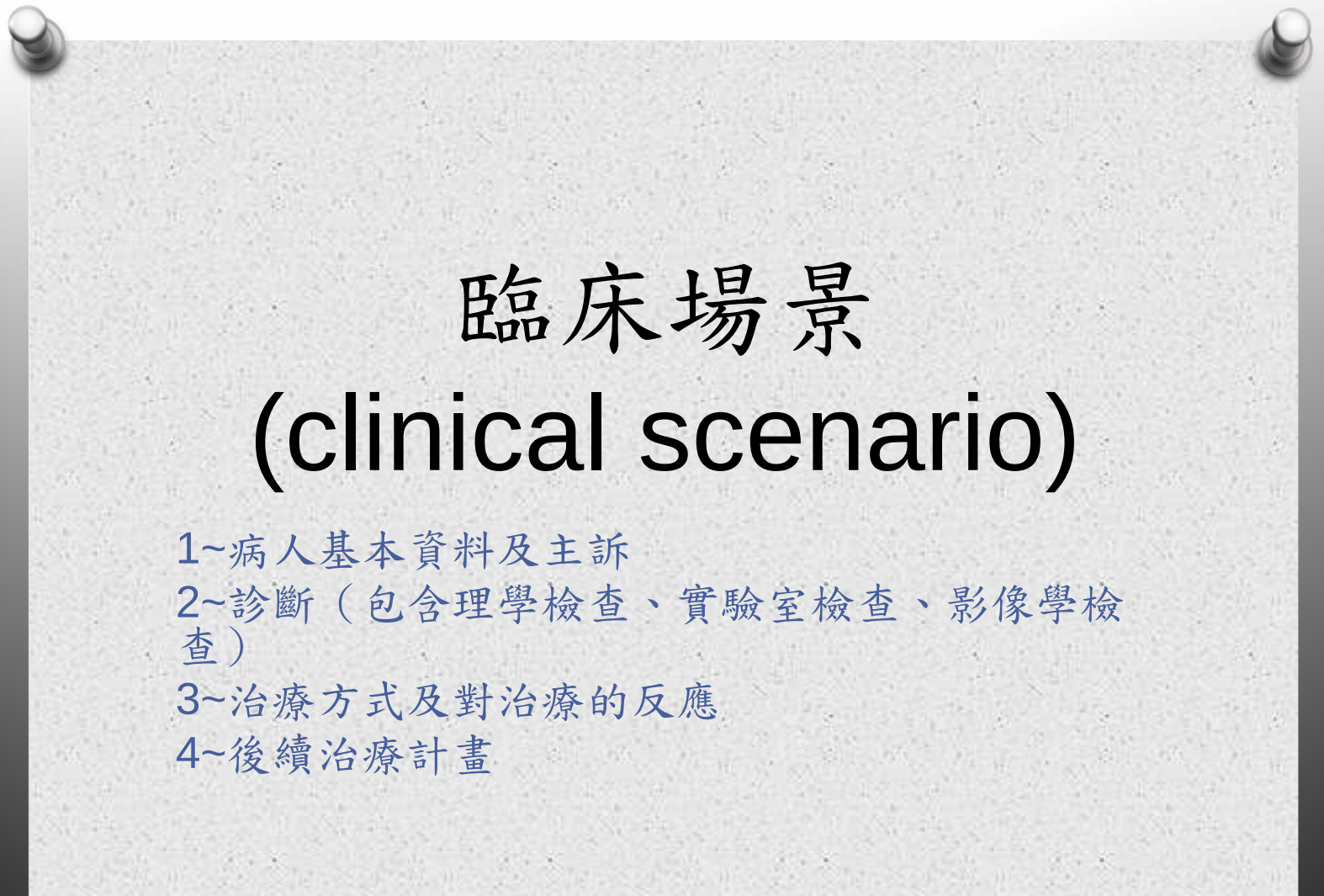




EBM report

家醫科 R2 戴志融 990311

2012.11.2



臨床場景 (clinical scenario)

1~病人基本資料及主訴

2~診斷（包含理學檢查、實驗室檢查、影像學檢查）

3~治療方式及對治療的反應

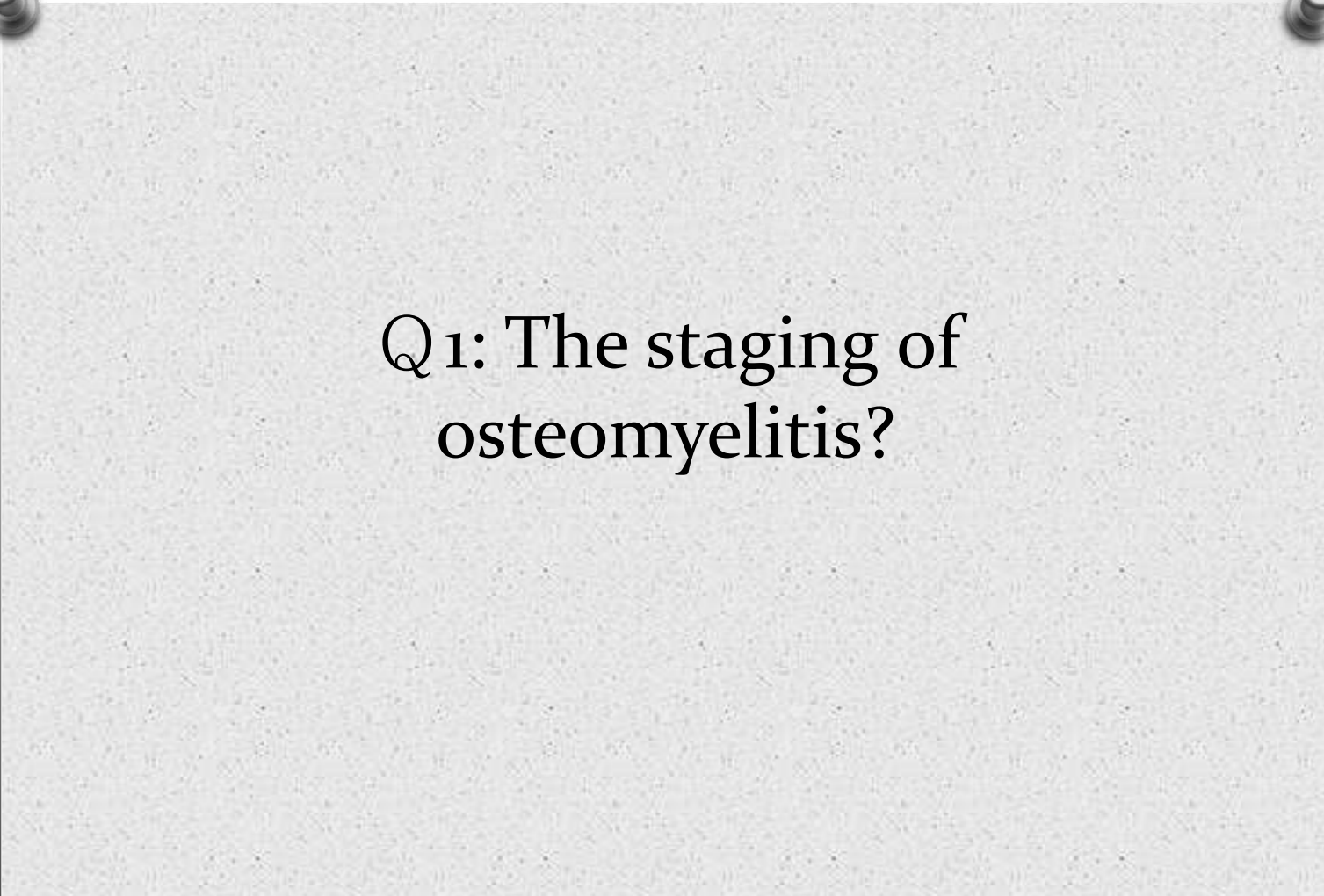
4~後續治療計畫

Clinical Scenario

- Chief complaint: right 2nd finger pain for 2 months
- Patient Profile:
 - 37 y/o, Male
 - 處理漁業
 - Opd → oral avelox, suspect mycobacterium avium
- Clinical finding:
 - Radiography: osteomyelitis over right 2nd finger PIP joint.
 - Bone biopsy: bone inflammation

Clinical Scenario

- o Diagnosis: Osteomyelitis
- o Treatment:
 - o Debridement
 - o Keep Avelox treatment
 - o Hyperbaricoxygen therapy.



Q1: The staging of
osteomyelitis?

Cierny-Mader staging system for long bone osteomyelitis

Anatomic type

Stage 1: Medullary osteomyelitis

Medullary osteomyelitis denotes infection confined to the intramedullary surfaces of the bone. Hematogenous osteomyelitis and infected intramedullary rods are examples of this anatomic type.

Stage 2: Superficial osteomyelitis

Superficial osteomyelitis is a true contiguous focus infection of bone; it occurs when an exposed infected necrotic surface of bone lies at the base of a soft-tissue wound.

Stage 3: Localized osteomyelitis

Localized osteomyelitis is usually characterized by a full thickness, cortical sequestration which can be removed surgically without compromising bony stability.

Stage 4: Diffuse osteomyelitis

Diffuse osteomyelitis is a through-and-through process that usually requires an intercalary resection of the bone to arrest the disease process. Diffuse osteomyelitis includes those infections with a loss of bony stability either before or after debridement surgery.

Physiologic class of host*

Class A denotes a normal host

Class B denotes a host with systemic compromise, local compromise, or both

Class C denotes a host for whom the morbidity of treatment is worse than that imposed by the disease itself

Q2: Is there any good image modalities for diagnosis of osteomyelitis?

Summary statistics of imaging modalities for diagnosis of osteomyelitis associated with diabetic foot ulcer

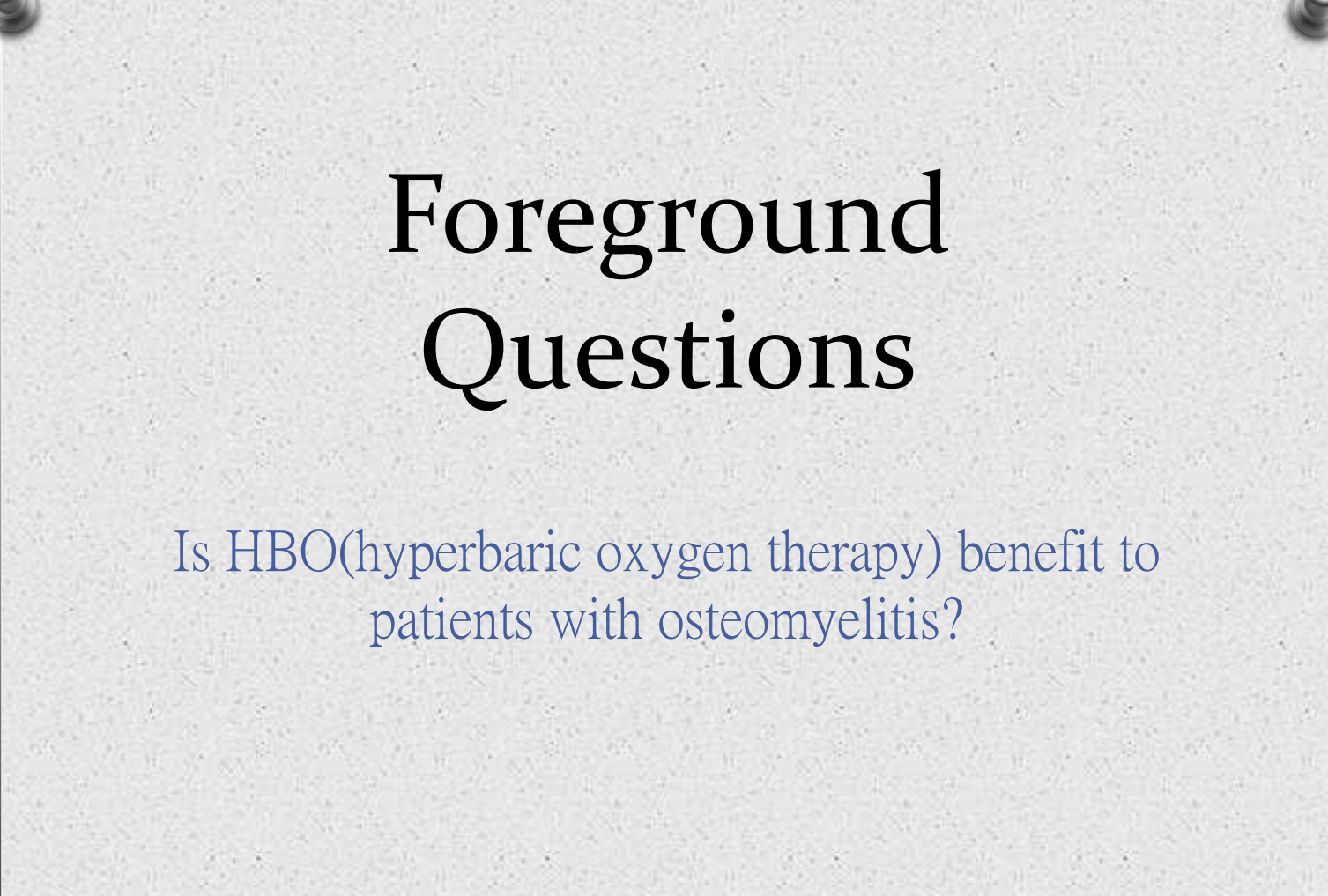
Diagnostic modality	Total patients	Sensitivity (95% confidence interval)	P value	Specificity (95% confidence interval)	P value
Probe-to-bone test or exposed bone	288	0.60 (0.46-0.73)	<.001	0.91 (0.86-0.94)	.11
Radiography	177	0.54 (0.44-0.63)	.006	0.68 (0.53-0.80)	.01
MRI	135	0.90 (0.82-0.95)	<.001	0.79 (0.62-0.91)	.41
Bone scan	185	0.81 (0.73-0.87)	<.001	0.28 (0.17-0.42)	.01
Leukocyte scan	269	0.74 (0.67-0.80)	<.001	0.68 (0.57-0.78)	.61

Q3: What is the standard management for osteomyelitis ?

- Debridement
- Antibiotics

Antibiotic therapy for osteomyelitis in adults

Infectious agent	Antibiotic	Dosing
MSSA	Nafcillin	1-2 g intravenously every 6 hours
	Oxacillin	1-2 g intravenously every 6 hours
	Cefazolin	1 g intravenously every 8 hours
MRSA*	Vancomycin	30 mg/kg intravenously every 24 hours in 2 equally divided doses; not to exceed 2 g/24 hours unless concentrations in serum are inappropriately low
Coagulase negative staphylococci	Vancomycin	30 mg/kg intravenously every 24 hours in 2 equally divided doses; not to exceed 2 g/24 hours unless concentrations in serum are inappropriately low
Gram negative organisms (including Pseudomonas)	Ciprofloxacin	750 mg orally twice daily
	Levofloxacin	750 mg orally once daily
	Ceftazidime	2 g intravenously every 8 hours
	Cefepime	2 g intravenously every 12 hours
Empiric therapy	Vancomycin PLUS an agent with activity against gram negative organisms	



Foreground Questions

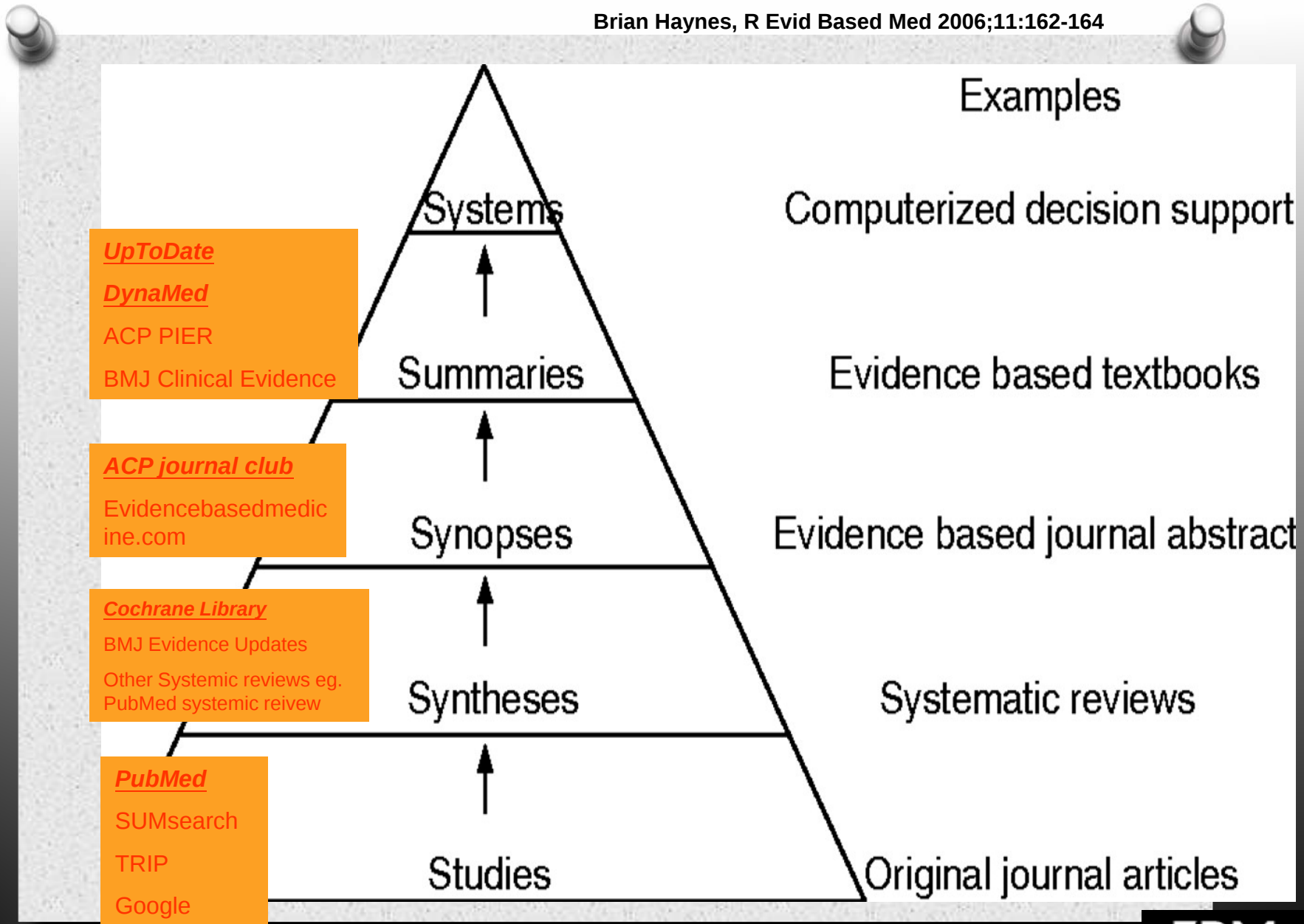
Is HBO(hyperbaric oxygen therapy) benefit to
patients with osteomyelitis?

將問題寫成PICO

P	Patient who has osteomyelitis
I	Hyperbaric oxygen therapy as an adjuvant therapy to debridement and antibiotics
C	Without hyperbaric oxygen therapy
O	Recurrent rate

The "5S" levels of organisation of evidence from healthcare research

Brian Haynes, R Evid Based Med 2006;11:162-164



EBM
ONLINE

搜尋 Summarie

Key Word: osteomyelitis, Hyperbaric oxygen therapy

Article: overview of osteomyelitis in adults

HBO may be useful adjunctive therapy in a small percentage of patients with refractory osteomyelitis. In a series including 142 patients with Refractory osteomyelitis treated with HBO, successful healing without relapse was observed in 73 percent of patients



搜尋 Synopses

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Results **1 - 2** of about **2** for **hyperbaric oxygen therapy**.

[2008 - Review: Little evidence exists for type of dressing or ...](#)

[2002 - 3 hyperbaric oxygen treatments reduced cognitive ...](#)

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Results **1 - 4** of about **4** for **Osteomyelitis**.

[2007 - Review: Magnetic resonance imaging is an accurate ...](#)

[2007 - Anidulafungin was noninferior to fluconazole for ...](#)

[2004 - A 10-day regimen of levofloxacin was not needed in ...](#)

[2002 - Caspofungin was as effective as amphotericin B for ...](#)

ACP Journal Club®

- 內容與提出的
P I C O無關

搜尋 Syntheses



Key Word: Osteomyelitis, Hyperbaric oxygen therapy

Osteomyelitis: 3 cochrane review

Hyperbaric oxygen therapy: 18 cochrane review

*內容與提出的PICO無關

搜尋 Studies

- Key word: Osteomyelitis AND Hyperbaric oxygen therapy.
- Publication date: 2012.11
- Species: Human
- Article Type: clinical trial
- 搜尋到的文章標題：83
- No related articles in hands.



Hyperbaric Oxygen Therapy in the Treatment of Chronic Refractory Osteomyelitis: A Preliminary Report

Chin-En Chen, MD; Shu-Tai Shih, MD; Te-Hu Fu¹, MD; Jun-Wen Wang, MD;
Ching-Jen Wang, MD

- Case series study(retrospective)
- Level of evidence: level 4
- (*Chang Gung Med J 2003;26:114-21*)

Background

Hyperbaric oxygen (HBO) has been proven to enhance bone and soft tissue healing in ischemic tissue in vitro and in vivo studies. Although only a few reports have been proven using controlled studies, this treatment modality remains encouraging for chronic refractory osteomyelitis. In this retrospective study, we reported the clinical results of HBO therapy for chronic refractory osteomyelitis.

Methods

From January through August 2000, 14 patients with chronic refractory osteomyelitis of the tibiae treated with HBO were available for follow-up examination. According to the Cierny-Mader classification, all patients were classified as type III or IV osteomyelitis. Adequate debridement and parenteral antibiotic treatment in conjunction with HBO therapy at 2.5 atmospheres absolute for 120 minutes, and 5 days per week regimen was used in all patients. The patients were followed-up for an average of 15 months after completion of HBO therapy.

Results

The most common infecting microorganism was *Staphylococcus aureus*. Mixed infections were usually found in patients with open fractures. The average number of operations before HBO therapy was 5.4 including soft tissue reconstruction in 11 patients. The average number of HBO treatments was 33.6 times. There were no HBO related complications. No recurrence of infection was noted in 11 patients, which resulted in a success rate of 79%.

Table 1. Data for Patients

Patient No.	Age (years)	Gender	Fracture type	Duration of infection (months)	+Osteomyelitis classification	Surgery (times)	HBO (times)	Follow-up (months)	Result
1	26	M	open IIIB	8	IVA	3	60	18	H
2	79	M	closed	14	IIIB	4	30	18	H
3	31	F	open IIIB	8	IVA	10	30	17	H
4	42	M	closed	48	IVB	8	40	17	H
5	73	F	closed	6	IVB	3	30	16	H
6	54	M	open II	7	IIIA	7	30	16	H
*7	64	M	closed	7	IVB	4	30	15	f
8	28	M	open IIIC	18	IVA	4	30	15	H
9	25	M	open IIIB	9	IIIB	3	40	15	H
*10	27	M	open IIIB	36	IVB	7	30	15	AK
11	75	M	open IIIB	7	IVB	4	30	15	H
12	66	M	closed	6	IIIB	4	30	14	H
*13	63	M	open IIIB	6	IVB	9	30	13	f
14	45	M	open IIIB	10	IIIA	5	30	12	H

Abbreviations: M: Male; F: Female; H: Healed; f: failed to heal; AK: above-knee amputation; +Cierny-Mader classification.

Conclusion

Hyperbaric oxygen therapy is effective and safe
for chronic refractory osteomyelitis



Appraisal (嚴格評讀)

對找到的文章
進行critical appraisal

AAMPICOT

- **Answer:** Does this paper **answer** your question?

- Not actually

- **Author:**

- Is the **author** an expert of the field?

- Yes,

- From the Department of Orthopedic Surgery, 1Department of Trauma Surgery, Chang Gung Memorial Hospital, Kaohsiung.

- Is there any conflict of interest?

- Not mentioned

證據等級(針對PubMed這篇)

Level	與[治療/預防/病因/危害]有關的文獻
1a	用多篇RCT所做成的綜合性分析(SR of RCTs)
1b	單篇RCT(有較窄的信賴區間)
1c	All or none
2a	用多篇世代研究所做成的綜合性分析
2b	單篇cohort及低品質的RCT
2c	Outcome research / ecological studies
3a	SR of case-control studies
3b	Individual case-control studies
4	Case-series(poor quality :cohort / case-control studies)
5	沒有經過完整評讀醫學文獻的專家意見

Grades of Recommendation

A	consistent level 1 studies
B	consistent level 2 or 3 studies <i>or</i> extrapolations from level 1 studies
C	level 4 studies <i>or</i> extrapolations from level 2 or 3 studies
D	level 5 evidence <i>or</i> troublingly inconsistent or inconclusive studies of any level

使用work sheet嚴格
評讀

THERAPY WORKSHEET

P

所取樣本是否有臨床代表性，是否與我的病人差不多？	與我的病人皆為 osteomyelitis 病人,但部位不同
分組是否有隨機盲法分組	否
對照組和實驗組進入實驗時是否相似？	是
是否病人都被放在原來的組別中做分析？	是
是否醫師和病人對治療都不知情？	無 double blind
失去追蹤個案數是否過多？ 5/20% rule	無 lose follow up

I and C

I是否清楚描述並且是可行的	是
C是否清楚描述並且是可行的	是

O

是否選用客觀的測量結果	是，觀察 recurrent 次數以 及手術次數
是否使用盲法(測量者與受試皆不知受試者被分在那一組)	No

T

測量結果的時間點是 否合乎邏輯	是
追蹤是否夠久	是



Apply

結合醫學倫理方法

將study的結果應用在病人身上

醫療現況

慢性骨髓炎的復發率極高，多重治療方式並沒有辦法確保一定會成功

病人意願

病人在臨床上配合意願高，願意進行Hyperbaric oxygen therapy

生活品質

慢性骨髓炎因治療需要一段很長的時間，造成病人生活上的不便利。

社會脈絡

病人於治療期間無法回復之前手部功能，因而無法繼續工作，對家庭經濟影響很大



Audit（自我評估）

在「提出臨床問題」方面的自我評估

- 我提出的問題是否具有臨床重要性？是，可以作為治療參考。
- 我是否明確的陳述了我的問題？
 - 我的foreground question 是否可以清楚的寫成PICO？可
 - 我的background question 是否包括what, when, how, who等字根？無
- 我是否清楚的知道自己問題的定位？（亦即可的、以定位自己的問題是屬於診斷上的、治療上的、預後上的或流行病學上的），並據以提出問題？知道，屬於治療範疇
- 對於無法立刻回答的問題，我是否有任何方式將問題紀錄起來以備將來有空時再找答案？有，但尚無時間尋找

在「搜尋最佳證據」方面的自我評估

- 我是否已盡全力搜尋？是
- 我是否知道我的問題的最佳證據來源？是
- 我是否從大量的資料庫來搜尋答案？是
- 我工作環境的軟硬體設備是否能支援我在遇到問題時進行立即的搜尋？是，學校買的版權資源非常便利
- 我是否在搜尋上愈來愈熟練了？是
- 我會使用「斷字」、布林邏輯、同義詞、MeSH term，限制 (limiters) 等方法來搜尋？部份會
- 我的搜尋比起圖書館人員或其他對於提供我病人最新最好醫療有熱情的同事如何？中

關於「嚴格評讀文獻」方面的自我評估

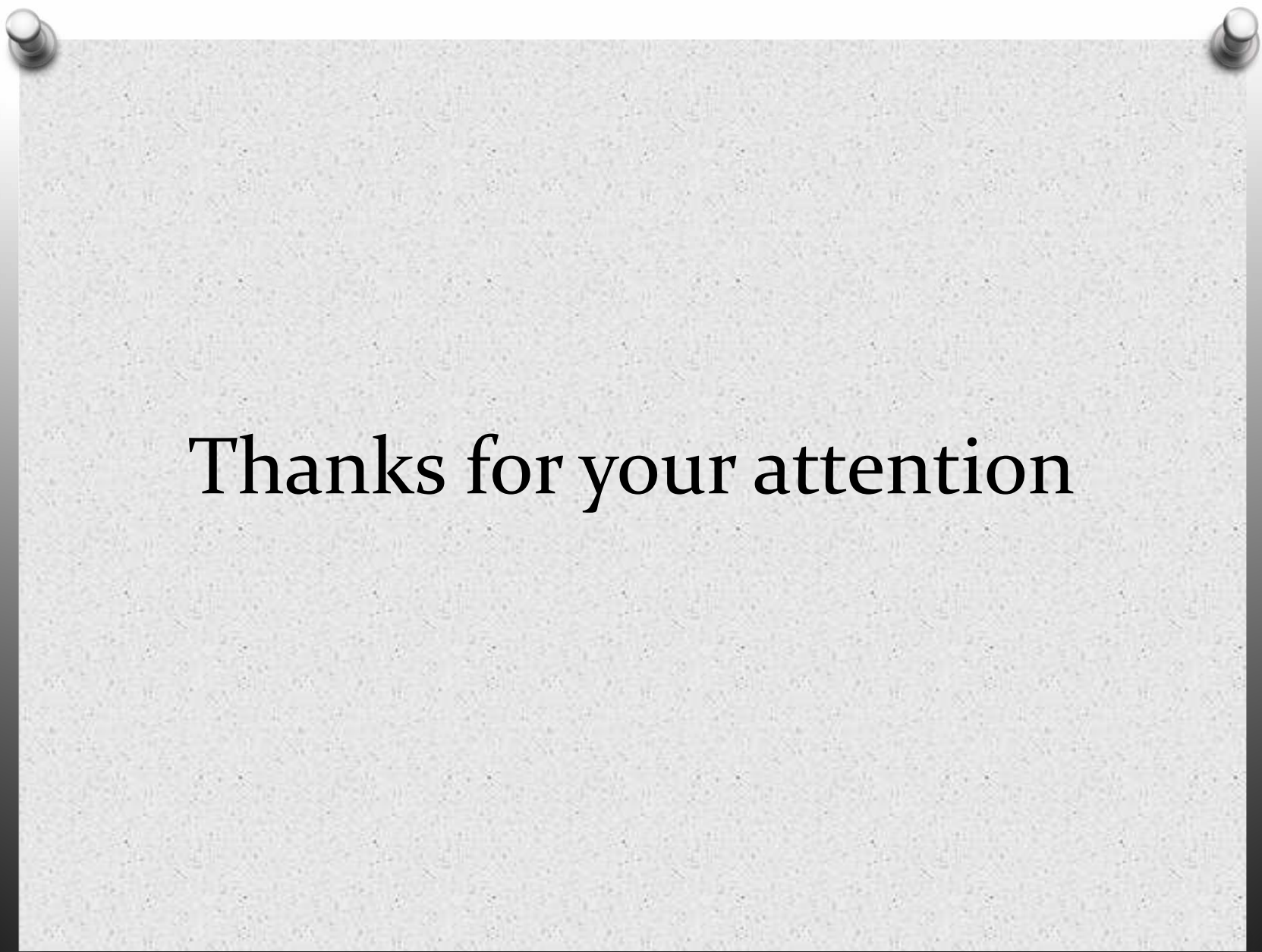
- 我是否盡全力做評讀了？是
- 我是否了解Number need to treat的意義？了解
- 我是否了解Likelihood Ratios的意義？了解
- 我是否了解worksheet每一項的意義？了解
- 評讀後，我是否做出了結論？是

關於「應用到病人身上」的自我評估

- 我是否將搜尋到的最佳證據應用到我的臨床工作中？ 是
- 我是否能將搜尋到的結論如NNT, LR用病人聽得懂的方式解釋給病人聽？
是
- 當搜尋到的最佳證據與實際臨床作為不同時，我如何解釋？ 與主治醫師討論

效率評估

- 這篇報告，我總共花了多少時間？好幾個晚上
- 我是否覺得這個進行實證醫學的過程是值得的？值得，學會了將臨床問題用實證醫學解決，也更熟悉EBM的操作以及一些評讀技巧
- 我還有那些問題或建議？評讀paper的方法不甚熟練



Thanks for your attention