



表淺性燒燙傷病人使用含銀敷料與磺胺嘧啶銀乳膏，對於感染、癒合、住院天數的成效比較： 系統性文獻回顧與統合分析

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簡介-燒燙傷深度

燒傷深度	第一度燒傷 superficial burns	第二度燒傷 partial thickness burns		第三度燒傷 full thickness burns	第四度燒傷
		淺二度燒傷 superficial partial thickness burns	深二度燒傷 deep partial thickness burns		
深度範圍	表皮淺層	表皮層真皮表層 (約三分之一以上)	表皮層真皮深層	全層皮膚	全層皮膚、皮下組織、肌肉、骨骼
症狀	皮膚發紅、腫脹、有明顯觸痛感	皮膚紅腫、起水泡，有劇烈疼痛及灼熱感	皮膚呈淺紅色起白色大水泡較不感覺疼痛	皮膚呈焦黑色，乾硬如皮革或為蒼白色，色素細胞與神經皆遭到破壞，疼痛消失	皮下脂肪、肌肉、神經、骨骼等組織壞死，呈焦炭狀
癒合情形	約3-5天即可癒合，無疤痕	約14天內即可癒合，會留下輕微疤痕或無疤痕	約21天以上即可癒合，會留下明顯疤痕，需儘早植皮治療，避免感染	無法自行癒合，會留下肥厚性疤痕，造成功能上的障礙，須依賴植皮治療	須依賴皮瓣補植治療、電療等特殊醫療，部份需截肢

簡介-燒燙傷程度與處置

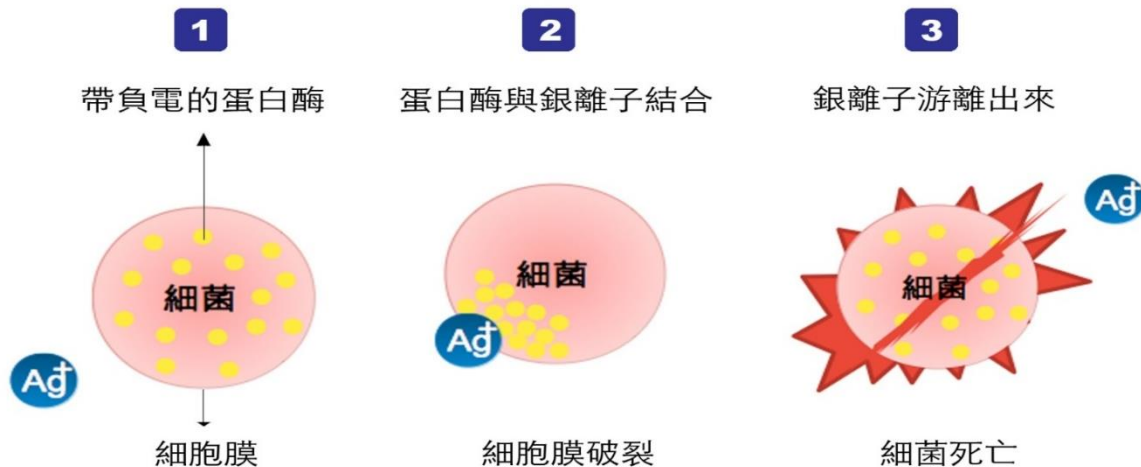
燒傷程度	輕度		中度		重 度		
燒傷深度	第二度	第三度	第二度	第三度	第二度	第三度	其 他
燒傷面積	成人 ＜15%	成人 兒童 ＜2%	成人 15-25%	成人 兒童 2-10%	成人 ＞25%	成人 兒童 ＞10%	臉、頸、手、腳、會陰 部二度以上之燒傷、吸入 性燒傷、電燒傷、燒傷連 帶外傷（骨折、頭部外傷 等）、燒傷含既存疾病 （糖尿病、癲癇等）
	兒童 ＜10%		兒童 10-20%		兒童 ＞20%		
醫療處置	至一般醫院門診換 藥治療		至設有燒傷治療小 組之一般醫院住院 治療		至設有燒傷病房之醫院或燒傷中心住院治療		



簡介-銀離子作用

➤ 銀離子抗菌原理

- 1.帶正電的銀離子，接觸到有負電的微生物細胞後便會相互吸附。
- 2.銀離子刺穿細胞外表，破壞細胞DNA及抑制蛋白質形成，讓細胞無法代謝及繁殖直至死亡，因而達至滅菌效果。
- 3.當細胞失去活性後，銀離子離開並繼續抗菌，具持續抗菌效能，不帶毒性和副作用。





現況

- 傷口穩定：以SSD換藥，出院前幾天更改敷料。
- 傷口不穩定：持續以SSD換藥，直到傷口以手術清創完，才更改敷料。
- 院內以Aquacel Ag為主。



含銀敷料真的比藥膏好嗎？

★減少換藥次數，減少疼痛？

- 感染？
- 癒合效果有差別嗎？

★能減少住院天數？

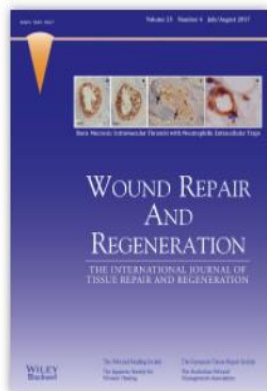


Systematic Review |  Open Access |   

Silver delivery approaches in the management of partial thickness burns: A systematic review and indirect treatment comparison

Leo Nherera MSc , Paul Trueman MA, Christopher Roberts PhD, Leena Berg PhD, MD

First published: 25 July 2017 | <https://doi.org/10.1111/wrr.12559> | Citations: 4



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Appraisal sheets(FAITH)

□ Appraisal Tool

□ [統合分析 Meta-analysis]

□ 步驟1：研究探討的問題為何 (PICO)

□ 步驟2：研究的品質如何 (內在效度)

□ 步驟3：研究結果之意義為何 (效益)





步驟1：系統性文獻回顧探討的問題為何？

研究族群／問題 (Population/ Problem)：

- Adults and children with deep partial and superficial partial thickness burns

介入措施 (Intervention)：

- Nanocrystalline silver (ACTICOAT), silver-impregnated hydrofiber dressing (AQUACEL AG), and silver-impregnated foam dressing (MEPILEX AG)

比較 (Comparison)：

- All silver delivery approaches including SSD, silver nitrate, nanocrystalline silver, silver-impregnated hydrofiber dressing, and silver-impregnated foam dressing

結果 (Outcomes)：

- Infection, LOS, time to healing/reepithelialization, incidence of surgical procedures (defined as debridement and skin grafting) and pain



Appraisal sheets(FAITH)

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□ 步驟3：研究結果之意義為何 (效益)



FAITH-研究是否找到所有的相關證據？

- 良好的文獻搜尋至少應包括二個主要的資料庫(如：Medline, Cochrane 考科藍實證醫學資料庫, EMBASE 等)，並且加上文獻引用檢索(參考文獻中相關研究、Web of Science, Scopus 或 Google Scholar)、試驗登錄資料等。文獻搜尋應不只限於英文，並且應同時使用 MeSH 字串及一般檢索詞彙(text words)。

P.708、附檔1

Literature search

Studies were identified by searches of the following electronic databases with no restrictions in language: PubMed, EMBASE, Cochrane Database of Systematic Reviews (CDSR), Cochrane Central Register of Controlled Trials (CENTRAL), Database of Abstracts of Reviews of Effects (DARE), Health Technology Assessment (HTA) Database, ClinicalTrials.gov, International Clinical Trials Registry Platform (ICTRP), and the European Trials Register. A search strategy, which included both free text and MeSH terms, was used to identify studies indexed on PubMed, and this was modified for searches of the other databases to account for differences in syntax and thesaurus headings. The search terms are shown in Appendix I (Supporting Information). The searches included citations from 1990 (when most of the commonly used silvers became available) to May 2015. A pearl-growing technique, whereby the references of relevant papers identified in the original search are searched, was used to identify further publications of interest.



FAITH-研究是否找到所有的相關證據？

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- 搜尋詞彙(搜尋策略)
- 搜尋年限：1990 to May 2015
- 不限語言

良好的文獻搜尋至少應包括二個主要的資料庫(如：Medline, Cochrane 考科藍實證醫學資料庫, EMBASE 等)，並且加上文獻引用檢索(參考文獻中相關研究、Web of Science, Scopus或 Google Scholar)、試驗登錄資料等。文獻搜尋應不只限於英文，並且應同時使用 MeSH字串及一般檢索詞彙(text words)。

評讀結果：

☒ 是

☐ 否

☐ 不確定



FAITH-研究是否找到所有的相關證據？

納入標準

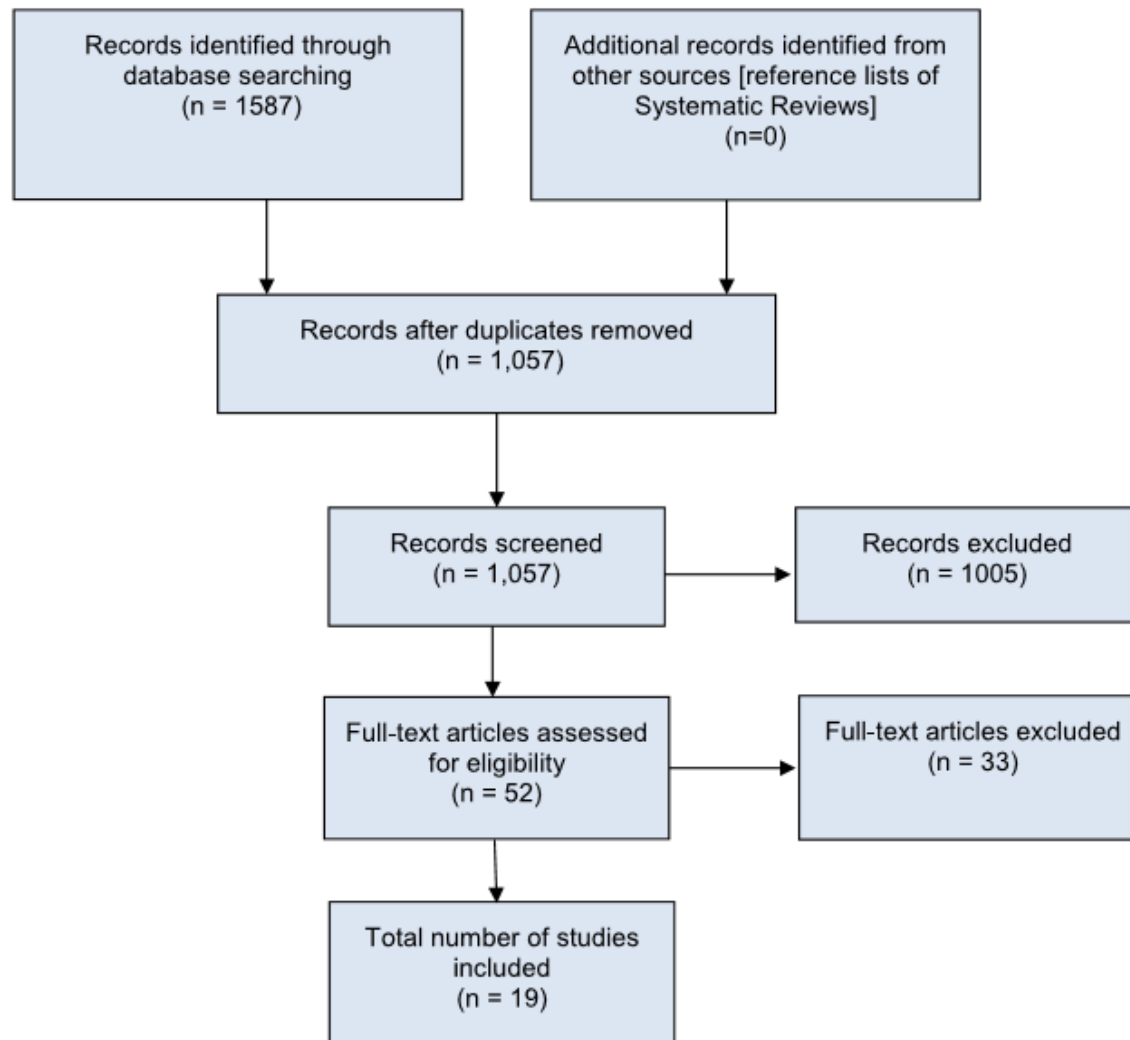
- RCTs, retrospective, and prospective comparative observational studies
- no restrictions in language
- Adults and children with deep partial and superficial partial thickness burns
- Nanocrystalline silver (ACTICOAT), silver-impregnated hydrofiber dressing (AQUACEL AG), and silver-impregnated foam dressing (MEPILEX)
- Infection, LOS, time to healing/reepithelialization, incidence of surgical procedures (defined as debridement and skin grafting) and pain

排除標準

- Systematic reviews, conference abstracts, case series, case reports, narrative reviews, editorials, opinions; studies performed in animals
- Full thickness burns
- Other silver dressings



PRISMA



FAITH-文獻是否經過嚴格評讀？

- 應根據不同臨床問題的文章類型，**選擇適合的評讀工具**，並說明每篇研究的品質（如針對治療型的臨床問題，選用隨機分配、盲法、及完整追蹤的研究類型）。

評讀結果：

☐ 是

☐ 否

☐ 不確定

Data extraction

Two reviewers independently assessed the full text papers of the studies identified during the abstract assessment stage for inclusion, based on the PICO eligibility criteria. Initially, five papers were fully independently data extracted by two reviewers using a standardized data extraction form and validated by one reviewer; however, because agreement between the two reviewers was high, the remaining papers were extracted by one reviewer and validated by a second reviewer. Any discrepancies were resolved through discussion, with involvement of a third reviewer if necessary.

Quality assessment

Two reviewers assessed the methodological quality of the studies independently. RCTs were assessed using the Cochrane risk of bias tool, which addresses seven specific domains: random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective outcome reporting, and “anything else.”¹⁴ The Good ReseArch for Comparative Effectiveness (GRACE) checklist, which is an 11-item tool, was used to assess the quality of data and methods of the observational studies.¹⁵



FAITH-文獻是否只納入良好效度的文章?

- 文章中未呈現評讀結果，無法得知納入文章之效度。

評讀結果：☐是 ☐否 ☒不確定



FAITH-是否以表格和圖表總結試驗結果?

評讀結果：☐是 ☐否 ☐不確定

FAITH-試驗的結果是否相近-異質性?

評讀結果：☐是 ☐否 ☐不確定

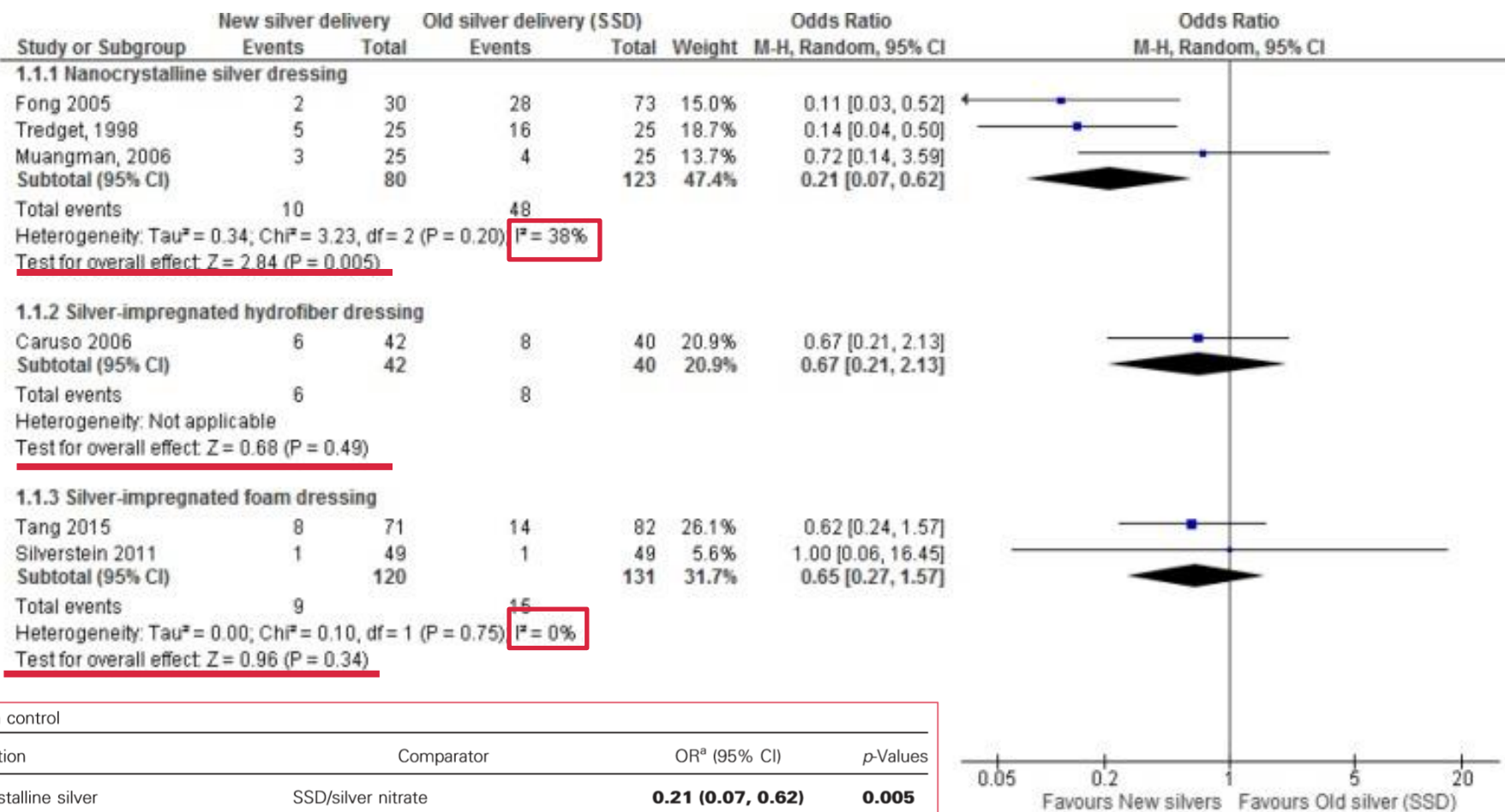
- 感染控制
- 住院天數
- 癒合/表皮再生時間
- 外科手術的發生率

- p 值 <0.05 認為具有統計學意義。
- 在統計異質性的基礎上，如果卡方檢驗 >0.1 或 $I^2<50\%$ ，則選擇固定效應模型

感染控制

incidence of infection

(A)



0.05 0.2 1 5 20
Favours New silvers Favours Old silver (SSD)

Infection control

Intervention	Comparator	OR ^a (95% CI)	p-Values
Nanocrystalline silver	SSD/silver nitrate	0.21 (0.07, 0.62)	0.005
Silver-impregnated hydrofiber dressing		0.67 (0.21, 2.13)	0.49
Silver-impregnated foam dressing		0.65 (0.27, 1.57)	0.34
Nanocrystalline silver	Silver-impregnated hydrofiber dressing	0.31 (0.06, 1.54)	0.1534
	Silver-impregnated foam dressing	0.32 (0.07, 1.53)	0.1549
Silver-impregnated hydrofiber dressing	Silver-impregnated foam dressing	1.29 (0.30, 5.45)	0.7437



住院天數

length of stay

(B)

Study or Subgroup	New silver delivery			Old silver delivery (SSD)			Weight	Mean Difference IV, Fixed, 95% CI
	Mean	SD	Total	Mean	SD	Total		
2.1.1 Nanocrystalline silver dressing								
Tonkin & Wood 2005	8.8	5.6	36	15.5	7.8	36	12.2%	-6.70 [-9.84, -3.56]
Fong 2005	12.5	6.25	19	17.25	8.8	49	8.6%	-4.75 [-8.49, -1.01]
Muangman, 2006	21	13	25	21	10	25	2.9%	0.00 [-6.43, 6.43]
Subtotal (95% CI)			80			110	23.7%	-5.17 [-7.42, -2.92]

Heterogeneity: $\chi^2 = 3.45$, $df = 2$ ($P = 0.18$) $I^2 = 42\%$

Test for overall effect: $Z = 4.50$ ($P < 0.00001$)

2.1.2 Silver-impregnated hydrofiber dressing

Dokter 2013	7.5	6.46	302	9.7	7.6	164	63.8%	-2.20 [-3.57, -0.83]	
Subtotal (95% CI)			302			164	63.8%	-2.20 [-3.57, -0.83]	

Heterogeneity: Not applicable

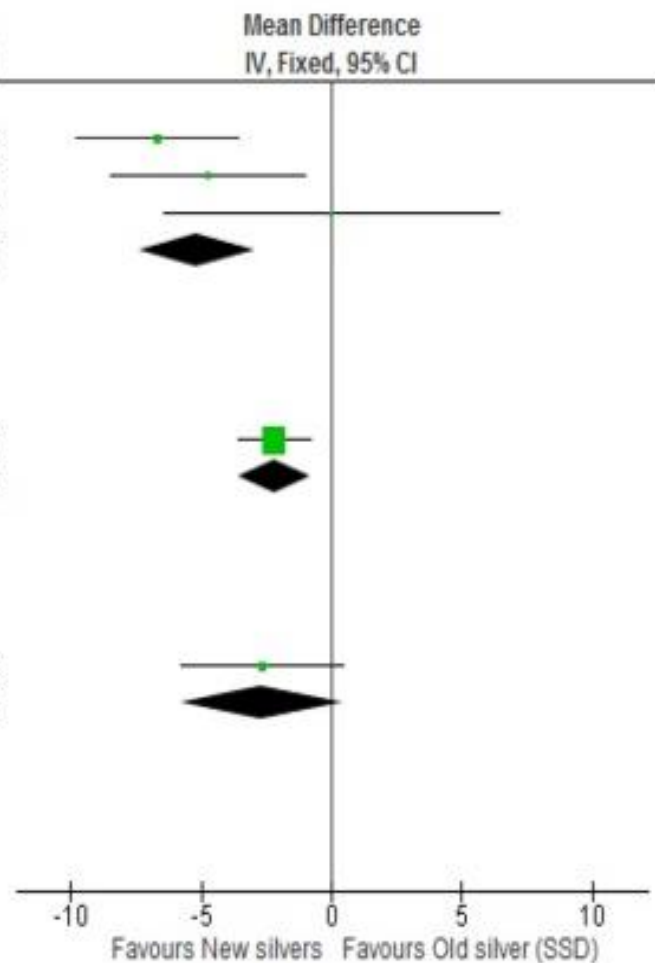
Test for overall effect: $Z = 3.14$ ($P = 0.002$)

2.1.3 Silver-impregnated foam dressing

Silverstein 2011	5.62	7.25	49	8.31	8.5	50	12.4%	-2.69 [-5.80, 0.42]	
Subtotal (95% CI)			49			50	12.4%	-2.69 [-5.80, 0.42]	

Heterogeneity: Not applicable

Test for overall effect: $Z = 1.70$ ($P = 0.09$)



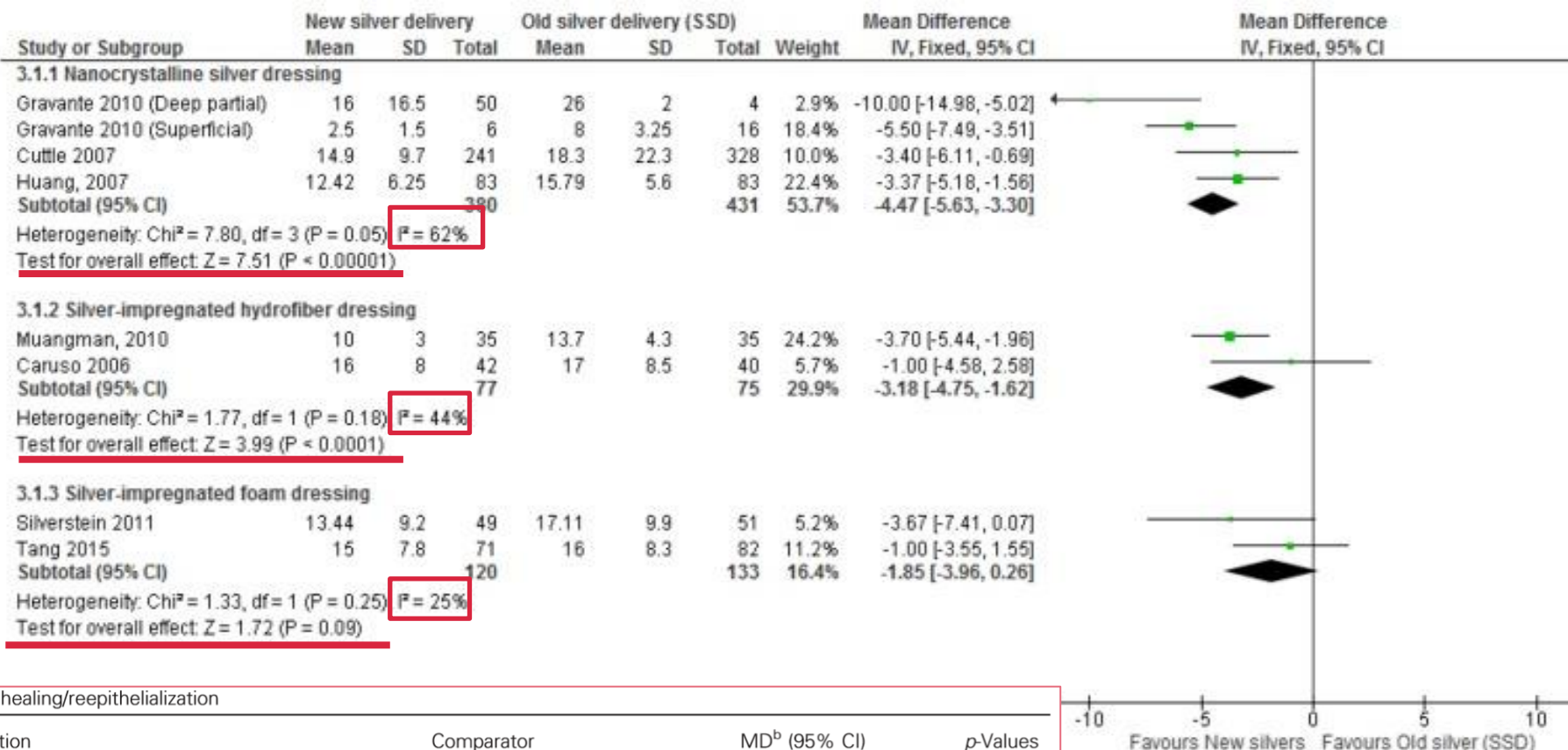
LOS

Intervention	Comparator	MD ^b (95% CI)	p-Values
Nanocrystalline silver	SSD/silver nitrate	-5.17 (-7.42, -2.92)	<0.00001
Silver-impregnated hydrofiber dressing		-2.20 (-3.57, -0.83)	0.002
Silver-impregnated foam dressing		-2.69 (-5.80, 0.42)	0.09
Nanocrystalline silver	Silver-impregnated hydrofiber dressing	-2.97 (-5.60, -0.34)	0.027
	Silver-impregnated foam dressing	-2.48 (-6.32, -1.36)	0.207
Silver-impregnated hydrofiber dressing	Silver-impregnated foam dressing	0.49 (-2.91, 3.89)	0.790

癒合/表皮再生時間

time to healing/reepithelialization

(C)



Time to healing/reepithelialization

Intervention	Comparator	MD ^b (95% CI)	p-Values
Nanocrystalline silver	SSD/silver nitrate	-4.47 (-5.63, -3.30)	<0.00001
Silver-impregnated hydrofiber dressing		-3.18 (-4.75, -1.62)	<0.0001
Silver-impregnated foam dressing		-1.85 (-3.96, 0.26)	0.09
Nanocrystalline silver	Silver-impregnated hydrofiber dressing	-1.29 (-3.24, 0.66)	0.1964
	Silver-impregnated foam dressing	-2.62 (-5.03, -0.21)	0.0328
Silver-impregnated hydrofiber dressing	Silver-impregnated foam dressing	-1.33 (-3.96, 1.30)	0.3259

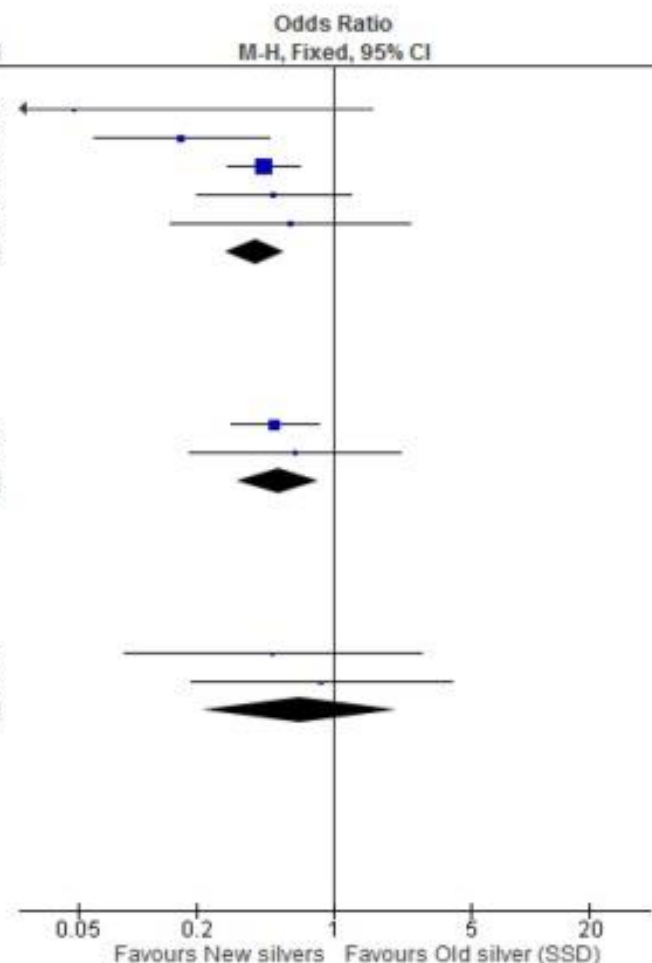


外科手術的發生率

incidence of surgical procedures

(D)

Study or Subgroup	New silver delivery		Old silver delivery (SSD)		Weight	Odds Ratio	
	Events	Total	Events	Total		M-H, Fixed, 95% CI	Odds Ratio
4.1.1 Nanocrystalline silver dressing							
Fong 2005	1	4	4	4	2.0%	0.05 [0.00, 1.56]	
Tonkin & Wood 2005	9	36	24	36	11.3%	0.17 [0.06, 0.46]	
Cuttle 2007	37	281	84	328	42.1%	0.44 [0.29, 0.67]	
Peters & Verchere 2006	9	30	34	73	8.7%	0.49 [0.20, 1.22]	
Muangman, 2006	4	25	6	25	3.2%	0.60 [0.15, 2.47]	
Subtotal (95% CI)		376		466	67.1%	0.40 [0.28, 0.56]	
Total events	60		152				
Heterogeneity: $\chi^2 = 4.96$, $df = 4$ ($P = 0.29$)							$I^2 = 19\%$
Test for overall effect: $Z = 5.24$ ($P < 0.00001$)							
4.1.2 Silver-impregnated hydrofiber dressing							
Dokter 2013	35	302	34	164	24.4%	0.50 [0.30, 0.84]	
Caruso 2006	5	42	7	40	3.9%	0.64 [0.18, 2.20]	
Subtotal (95% CI)		344		204	28.3%	0.52 [0.32, 0.84]	
Total events	40		41				
Heterogeneity: $\chi^2 = 0.12$, $df = 1$ ($P = 0.73$)							$I^2 = 0\%$
Test for overall effect: $Z = 2.68$ ($P = 0.007$)							
4.1.3 Silver-impregnated foam dressing							
Silverstein 2011	2	49	4	50	2.4%	0.49 [0.09, 2.80]	
Tang 2015	3	71	4	82	2.2%	0.86 [0.19, 3.98]	
Subtotal (95% CI)		120		132	4.6%	0.67 [0.21, 2.10]	
Total events	5		8				
Heterogeneity: $\chi^2 = 0.23$, $df = 1$ ($P = 0.63$)							$I^2 = 0\%$
Test for overall effect: $Z = 0.69$ ($P = 0.49$)							



Intervention	Comparator	OR ^a (95% CI)	p-Values
Nanocrystalline silver	SSD/silver nitrate	0.40 (0.28, 0.56)	<0.00001
Silver-impregnated hydrofiber dressing		0.52 (0.32, 0.84)	0.007
Silver-impregnated foam dressing		0.67 (0.21, 2.10)	0.49
Nanocrystalline silver	Silver-impregnated hydrofiber dressing	0.77 (0.42, 1.39)	0.3937
	Silver-impregnated foam dressing	0.60 (0.18, 1.99)	0.4078
Silver-impregnated hydrofiber dressing	Silver-impregnated foam dressing	0.78 (0.22, 2.70)	0.7038



評讀總表

系統性文獻回顧的品質

研究是否找到(Find)所有的相關證據？

評讀結果：是

文獻是否經過嚴格評讀(Appraisal)？

評讀結果：是

是否只納入(Included)具良好效度的文章？

評讀結果：不確定

作者是否以表格和圖表「總結」(Total up)試驗結果？

評讀結果：是

一試驗的結果是否相近一異質性(Heterogeneity)？

評讀結果：是





Appraisal sheets(FAITH)

□ Appraisal Tool

□ [統合分析 Meta-analysis]

□ 步驟1：研究探討的問題為何 (PICO)

□ 步驟2：研究的品質如何 (內在效度)

□ 步驟3：研究結果之意義為何 (效益)



總結-感染控制差異

選用文獻	SSD	奈米銀	浸銀水纖維敷料	浸銀泡棉敷料
Fong 2005 Australia	28/51 (54.9%)	2/19 (10.5%)		
Tredget 1998 Canada	16/25 (64%)	5/25 (20%)		
Muangman 2006 Thailand	4/25 (16%)	3/25 (12%)		
Caruso 2006 USA	8/40 (20%)		6/42 (14.3%)	
Tang 2015 China	14/82 (17.1%)			8/71 (11.3%)
Silverstein 2011 USA	1/49 (2%)			1/49 (2%)



總結-住院天數差異

選用文獻	SSD	奈米銀	浸銀水纖維敷料	浸銀泡棉敷料
Tonkin & Wood 2005 Australia	15.5 ± 7.8 days	8.8 ± 5.6 days		
Fong 2005 Australia	17.25 ± 8.8 days	12.5 ± 6.25 days		
Peters and Verchere 2006 Canada	13.85 ± 10.2 9 days	0.83 ± 2.34 days		
Dokter 2013 Netherlands	9.7 (7.60) days		7.5 (6.46) days	
Silverstein 2011 USA	8.31 ± 8.5 days			5.62 ± 7.25 days

總結-癒合/表皮再生時間差異

選用文獻	SSD	奈米銀	浸銀水纖維敷料	浸銀泡棉敷料
Gravante 2010 UK (<i>deep partial</i>)	26 days	16 days	21 days	
Gravante 2010 UK (<i>superficial</i>)	8 days	2.5 days	12 days	
Huang 2007 China	15.79 ± 5.6 days	12.42 ± 6.2 5 days		
Cuttle 2007 Australia	18.3 ± 22.3 days		14.9 ± 9.7 days	
Muangman 2010 Thailand	13.7 ± 4.3 days		10 ± 3 days	
Caruso 2006 USA	17 ± 8.5 days		16 ± 8 days	
Tang 2015 China	16 ± 5.25 days			15 ± 5.25 days

總結-外科手術的發生率差異

選用文獻	SSD	奈米銀	浸銀水纖維敷料	浸銀泡棉敷料
Fong 2005 Australia	284/4 (100%)	1/4 (25%)		
Tonkin & Wood 2005 Australia	24/36 (66.7%)	9/36 (25%)		
Cuttle 2007 Australia	84/328 (25.6%)	37/281 (13.2%)		
Peters and Verchere 2006 Canada	34/73 (47%)	9/30 (30%)		
Muangman 2006 Thailand	6/25 (24%)	4/25 (16%)		
Dokter 2013 Netherlands	34/164 (20.7%)		35/302 (11.6%)	
Caruso 2006 USA	7/40 (17.5%)		5/42 (11.9%)	
Silverstein 2011 USA	4/50 (8.0%)			2/49 (4.1%)
Tang 2015 China	4/82 (4.9%)			3/71 (4.2%)





限制

- 本文獻僅進行三種銀離子敷料分別與SSD藥膏比較，或是兩種敷料的間接比較，缺少三種敷料間的直接比較數據。
- 文獻中採用的疼痛數據顯示出高度異質性(因未使用相同疼痛評估量表)，因此未能以圖表呈現統計結果。
- 仍須考量臨床症狀選擇敷料(深度、面積、部位...)，因會影響癒合時間。

依系統性文獻回顧之結論……

- 是否同意表淺性燒燙傷傷口以含銀水纖維敷料取代現有SSD藥膏？



(綠牌) 同意：3位
(紅牌) 不同意：0位
(黃牌) 待評估：14位



感謝聆聽

