

Centro Internazionale Nursing Vulnologico

Cura dei Fissatori Esterni: Prevenzione delle Infezioni Rapid Review

Aprile 2022

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Saluti da Massimo Rivolo,

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A dicembre 2021 il CINV ha pubblicato una revisione rapida sull'utilità delle superfici antidecubito, razionale d'uso ed evidenze disponibili in letteratura. Il seguente documento è invece dedicato alla cura dei fissatori esterni e relativa prevenzione delle infezioni. Abbiamo scelto di approfondire questo argomento poiché sono molte le modalità con cui i fissatori vengono trattati sia in ambito di prevenzione delle infezioni sia nella gestione routinaria senza che vi sia però una chiara indicazione su quale sia l'intervento migliore e basato su prove di efficacia.



Il documento che abbiamo sviluppato deve servire al professionista a riflettere sugli interventi infermieristici da potere erogare quando si deve trattare un paziente con un fissatore esterno, chiedendosi in particolare:

• Quale trattamento è efficace (evidenze disponibili?) nel ridurre la comparsa delle infezioni sul sito dei fissatori?

La nostra speranza è di riuscire ad estrapolare dalla letteratura qualche documento in grado di fornire indicazioni utili alla pratica.

La cura dei fissatori esterni è un atto prevalentemente basato sull'esperienza in cui l'efficacia degli interventi è spesso dubbia o almeno poco dimostrata. Compito di questa revisione è di verificare se esista un protocollo standardizzato per la cura dei fissatori esterni di provata

efficacia o se ahimè il trattamento rimane pressoché un atto non è supportato da prove di efficacia.

Come sempre vi rinnovo i miei saluti e ringrazio i revisori che mi aiutano, mi supportano e mi sopportano nelle pubblicazioni.

Insieme possiamo edificare e "costruire un mondo migliore per i pazienti e le famiglie che lottano contro le ulcere cutanee croniche"

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I fissatori esterni.

Introduzione

I fissatori esterni sono usati da circa 2000 anni per il trattamento delle fratture, pur con modalità differenti e il miglioramento delle tecnologie, i principi della biodinamica che seguono rimangono pressoché identici (Hadeed et al, 2021).

I principali fissatori esterni si dividono in diverse subcategorie:

Uniplanari

Multiplanari

Unilaterali

Bilaterali

Circolari (Hadeed et al, 2021). In questo link potete vedere alcuni modelli di fissatori esterni (https://tinyurl.com/4fwh5ee3)

Le principali complicazioni associate ai fissatori esterni variano dal 7% al 100% con le infezioni che ricoprono la maggior parte dei rischi (*Walker, 2012*). In un articolo rinvenuto in letteratura, su circa 214 fissatori esaminati dopo la rimozione, il 74.8% presentava batteri e di essi il 37.5% erano rappresentati da *Stafilococchi Aurei* e il 9.4% da *Escheria Coli* con una correlazione positiva tra fissatori poco stabili e infezioni, a supporto della teoria secondo la quale la mobilità dei tessuti molli sarebbe un importante fattore per lo sviluppo di infezioni (*Bible et al, 2015*). Le infezioni sono una complicanza temibile che può compromettere la riparazione ossea o in taluni casi condurre ad osteomielite ed infezione sistemica. (*Lethaby et al, 2013*).

La cura dei fissatori varia considerevolmente, tanto che una revisione Cochrane (2008) che ha analizzato tutti i tipi di trattamenti locali dal 1950 in poi, **non ha trovato evidenze sufficienti** a favore di una strategia vs un'altra nel diminuire i tassi di infezione (*Lethaby et al, 2008*). Sempre nel 2013 la Cochrane ha svolto un update della precedente revisione giungendo pressoché alle stesse conclusioni ossia: scarse evidenze, studi di qualità molto bassa ed eterogenei con l'esplicita raccomandazione di creare RCTs di buona qualità (*Lethaby et al, 2013*).

La descrizione corretta di infezione dei fili metallici (Pin Tract Infection PTI) è poco chiara ed ha portato alla creazione di tre definizioni basate sul consenso degli esperti secondo i quali si possono rinvenire: reazione, colonizzazione e infezione (Lee-Smith et al, 2001) sul sito di inserzione.

- Reazione: normale cambiamento (colore cutaneo, ipertermia locale o fuoriuscita di liquido) dopo posizionamento del filo metallico che regredisce nelle 72 ore. (Lee-Smith et al, 2001)
- Colonizzazione: presenza di calore attorno al filo metallico, secrezione con presenza di batteri alla cultura e dolore. (Lee-Smith et al, 2001)
- Infezione: tutti segni e sintomi precedenti con fuoriuscita di pus, allentamento dei fili e accresciuta carica microbica. (*Lee-Smith et al, 2001*)

Esistono altre classificazioni create per descrivere le PTIs, che si basano su segni clinici quali la classificazione di Clint che usa i termini good", "bad" or "ugly (*Clint et al, 2010*), oppure quella di Santy che usa invece i termini "calm", "irritated" or "infected" (*Santy et al, 2009*). In questo documento troverete ancora un'altra classificazione.

Nelle pagine seguenti cercheremo di fare una analisi ed un riassunto dei principali interventi volti a prevenire le PTIs. La strategia di ricerca verrà esplicitata nel documento.

Nota. Questa è una revisione narrativa (Rapid Review) della letteratura e non una revisione sistematica. Per ulteriori informazioni sulla natura delle due, si prega di prendere visione cliccando questo link: https://tinyurl.com/mrxsafnn

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Strategie della Ricerca

In questo documento verrà analizzata la letteratura rinvenuta a favore dei possibili interventi volti a prevenire le PTIs. Verranno discussi i singoli studi (tutti in full text tranne uno) per valutare se vi siano raccomandazioni degne di nota da suggerire al lettore. Al termine cercheremo di trarre alcune conclusioni utili con relative implicazioni per la pratica.

La strategia di ricerca utilizzata è riassunta di seguito:

PICO: "in patient with external fixators are topical antiseptics useful to prevent infection compared to saline solution?"

PICO: "in patient with external fixators are topical antiseptics useful to prevent infection compared to no intervention?"

PICO: "in patient with external fixators are topical antibiotics useful to prevent infection compared to saline solution?"

PICO: "in patient with external fixators are topical antibiofilm agents useful to prevent infection compared to saline solution?"

Ricerca libera: ((Pressure relieving support surfaces) AND (Pressure ulcers)) AND (management)

Database utilizzati: PubMed, Cochrane Wounds.

Limiti: Anno 2010-2022. Article Type: RCTs, Clinical Trial, Meta-Analysis, Review, Systematic Review.

PubMed. Clinical Queries: (((External fixators) AND (topical antiseptics)) AND (Saline Solution)) AND (Infection prevention). Risultati: 1

PubMed. Clinical Queries: (((External Fixators) AND (topical antiseptics)) AND (no intervention)) AND (Infection prevention). Risultati 1

PubMed. Clinical Queries: (((External Fixators) AND (topical antibiotics)) AND (saline solution)) AND (Infection prevention) Risultati 0

PubMed. Clinical Queries: (((External Fixators) AND (topical antibiofilm)) AND (saline solution)) AND (Infection prevention) Risultati 0

PubMed: Clinical Queries: (((External fixators) AND (topical antiseptics)) AND (Saline Solution)) AND (Pin tract infection). Risultati 0.

PubMed: Clinical Queries: (((External Fixators) AND (topical antiseptics)) AND (no intervention)) AND (pin tract infection). Risultati 0

PubMed: (((External Fixators) AND (topical antibiotics)) AND (saline solution)) AND (pin tract infection). Risultati 0.

PubMed: (((External Fixators) AND (topical antibiofilm)) AND (saline solution)) AND (pin tract infection) Risultati 0.

PubMed: Key Word: *Pin Site Care*. Limiti: anno 2010-2022. Article Type: RCTs, Clinical Trial, Meta-Analysis, Review, Systematic Review. Risultati 22.

PubMed: Key Word: *Pin Site Infection*. Limiti: anno 2010-2022. Article Type: RCTs, Clinical Trial, Meta-Analysis, Review, Systematic Review. Risultati 45.

Nella tabella in **Appendice A** sono presenti gli studi che abbiamo rinvenuto, si ricorda che sono stati presi in considerazione solo RCTs, Meta-analisi, Clinical Trials, Revisioni Sistematiche (vedi sopra) per non appesantire questo lavoro con documenti di bassa solidità scientifica. Altri limiti inclusi sono: lingua inglese e Humans.

In **Appendice B** il PRISMA Flow Diagram.

Prevenzione delle infezioni

Il primo articolo, un RCT (di piccolissime dimensioni 15 pazienti per gruppo), prende in considerazione l'efficacia dello iodio polivinilpirrolidone 10% vs soluzione salina per la prevenzione delle infezioni nei pazienti con Ilizarov (Camilo et al, 2005). Le infezioni che si localizzano attorno ai fili metallici sono spesso polimicrobiche, per questo motivo, gli autori hanno impiegato lo iodio che risulta essere attivo contro i Gram positivi e Gram negativi, virus, protozoi, lieviti e funghi, inoltre non è irritante, non corrode il metallo e non altera la funzione tiroidea (Camilo et al, 2005). Come misura aggiuntiva alla prima comparsa di infezione localizzata, sono stati somministrati antibiotici ed aumentato il numero cambi medicazione (Camilo et al, 2005). I risultati non hanno mostrato alcun cambiamento statisticamente significativo nei due gruppi in termini di comparsa di infezioni usando lo iodio vs la soluzione salina (Camilo et al, 2005). Fonte: RCT Nota: questo articolo è datato 2005, ma è stato incluso poiché ritenuto interessante.

Nella loro revisione, Ktistakis e collaboratori hanno analizzato 369 manoscritti con lo scopo di valutare quale protocollo per la cura dei fili metallici fosse efficace in termini di prevenzione delle infezioni; di questi soltanto 13 sono stati inclusi (Ktistakis et al, 2015). In linea di massima i protocolli comprendevano l'impiego di diverse soluzioni, quali: soluzione salina 0.9%, alcool 70%, nessun trattamento locale, garze impregnate di iodio povidone, Xeroform/Xeroflo, vaselina, saponi antibatterici, docce, perossido di idrogeno, rimozione delle croste, medicazioni impregnate con clorexidina, garze impregnate con PHMB, sulfadiazina argentica e la frequenza dei cambi medicazione variava da una a due volte al giorno (Ktistakis et al, 2015). Secondo gli autori il Gold Standard per la prevenzione delle PTIs non è ancora chiaro, pare comunque che anche la sede anatomica dove vengono posizionati i fissatori sia correlata con le infezioni: la porzione di coscia sembra meno interessata dalle infezioni rispetto alla porzione distale dell'arto inferiore (Ktistakis et al, 2015). Degno di nota è il metodo russo sulla gestione dei fili metallici che risulta essere pratica ben riconosciuta ed approvata dal Royal College of Nursing per la prevenzione delle infezioni (qui il link dell'articolo citato in questa revisione https://tinyurl.com/5bppw7t9) e che ha dimostrato essere statisticamente superiore (chi-squared test, p = 0.003) rifiutando l'ipotesi nulla sulla non differenza tra numero di infezioni nei due gruppi (Ktistakis et al, 2015). Fonte: Review.

La revisione della Cochrane sulla cura dei Pin Site (fili metallici) per la prevenzione delle infezioni ha analizzato 11 trials con rispettivi protocolli (*Lethaby et al, 2013*). Anche in questo caso le evidenze disponibili sono scarse, gli studi eterogenei e le raccomandazioni formulate dalla Cochrane suggeriscono la futura creazione di studi clinici adeguati che considerino i differenti protocolli e i co-interventi associati quali la terapia antibiotica. (*Lethaby et al, 2013*). **Fonte: Revisione Sistematica**

Il Trial Randomizzato e Controllato (RCT) prodotto da Subramanyam e collaboratori ha comparato diverse modalità di gestione dei Pin Sites usando Clorexidina, Iodio Povidone, Argento Sulfadiazina e Clorexidina (Subramanyam et al, 2019). Nello studio proposto, il gruppo trattato con clorexidina ha avuto meno infezioni così come il gruppo che sostituiva giornalmente la medicazione rispetto al cambio settimanale, purtroppo in entrambi i casi non vi è significatività statistica quindi gli autori hanno concluso che gli antisettici topici non modificano il rischio di infezioni e il cambio giornaliero non incide sulla prevalenza delle infezioni rispetto ad un cambio settimanale (Subramanyam et al, 2019). Fonte: RCT

La gestione delle croste che si formano attorno ai Pin Sites sono fonte di discussione e la loro modalità di gestione è stata studiata in una Revisione Sistematica Integrativa in cui si prendeva in considerazione la crosta quale modalità di medicazione biologica da non rimuovere vs la loro rimozione per la prevenzione delle infezioni (Georgiades, 2018). Le croste che si formano sono costituite dall'essudato secco fermamente adeso ai Pin Sites (Georgiades, 2018). Alcuni autori sostengono che le croste siano in grado di prevenire le infezioni, mentre altri credono invece che ne aumentino la probabilità di comparsa (Georgiades, 2018). Secondo uno studio rinvenuto in questa revisione (l'unico a proporre questa metodica), le croste fungono da medicazioni biologiche ad effetto barriera contro le infezioni grazie all'effetto sigillante dei cheratinociti, la loro non rimozione potrebbe quindi essere di aiuto alla prevenzione delle infezioni, ma gli autori riconoscono che in caso di infezione, quest'ultima sia più refrattaria ai trattamenti quando le croste non vengono rimosse (Georgiades, 2018). Le conclusioni degli autori sono quindi a favore di studi ben disegnati, poiché la ritenzione delle croste trova la sua ipotesi in questo solo unico studio presente in letteratura (Georgiades, 2018). Fonte: Review.

Tra i documenti rinvenuti dalla ricerca, un RCT ha comparato l'uso di antisettici in soluzione per la cura dei Pin Sites nello specifico la Clorexidina al 2% in alcool vs Iodio Povidone 10%, con l'intenzione di dimostrare la superiorità della prima rispetto allo iodio (Sáenz-Jalón et al, 2020). L'end point primario era la comparsa di PTI nei due gruppi (Sáenz-Jalón et al, 2020). Come per gli studi presentati finora, anche in questo non vi è stata alcuna differenza statisticamente significativa tra i due preparati in termini di prevenzione delle infezioni, l'unica variabile degna di nota è il tempo di applicazione dei fissatori, maggiore il periodo trascorso con il dispositivo, maggiore il rischio di infezioni (Sáenz-Jalón et al, 2020). Gli autori hanno comunque esplicitato che questo studio presenta numerose limitazioni a causa di differenti bias (Sáenz-Jalón et al, 2020). Fonte: RCT.

Ferguson e collaboratori hanno sviluppato un trial randomizzato prospettico con l'intenzione di comparare la soluzione alcoolica di clorexidina vs un regime di cura

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della cute usando un emolliente (Dermol 500®, lozione a base di Benzalconio Cloruro con Clorexidina e paraffina liquida) per il trattamento dei Pin Sites (Ferguson et al, 2021). Anche in questo studio, non sono state riscontrate differenze statisticamente significative usando il Dermol 500® rispetto alla clorexidina ed è quindi difficoltoso fornire raccomandazioni in merito (Ferguson et al, 2021). Fonte: RCT.

Un altro RCT ha comparato la cura dei Pin Sites effettuata giornalmente versus l'assenza totale di qualsiasi trattamento locale (Camathias et al, 2012). Questo intrasubject, randomised, prospective controlled trial (ci abituiamo un po' alla volta alla terminologia inglese, indispensabile per qualsiasi ricerca scientifica) è unico nel suo genere poiché si è posto il compito di verificare se l'assenza di qualsiasi trattamento locale potesse risultare in outcomes differenti rispetto alla moltitudine di interventi, che, come il lettore ha potuto finora sperimentare, risultano essere pressoché tutti molto deludenti (Camathias et al, 2012). Gli end points considerati dal valutatore (in cecità) sono stati: 1) le condizioni del tessuto morbido, 2) la stabilità dei fili metallici, 3) la stabilità torsionale dei fili, 4) l'osteolisi pre-rimozione documentata radiograficamente, 5) il dolore sul sito d'inserzione (Camathias et al, 2012). Un importante aspetto riportato è la presenza di tessuto di granulazione e la secrezione di fluidi attorno al Pin Site che, secondo gli autori, richiederebbe una rapida valutazione poiché sarebbero segni di instabilità dei fili metallici (Camathias et al, 2012). Gli autori concludono questo studio dimostrando che non esiste alcuna differenza tra un regime di cura dei Pin Sites, con qualsivoglia prodotto, rispetto al non erogare alcun tipo di cura locale auspicando che questo RCT possa essere di aiuto nella gestione dei fissatori esterni (Camathias et al, 2012). Fonte: RCT.

Un'altra revisione (Guerado et al, 2019) che ha considerato la sostituzione dei fissatori esterni con i fissatori intramedullary (intramedullari), ha descritto le varie tecniche per la gestione dei Pin Sites prendendo in considerazione quelle già ampiamente menzionate in questo scritto, fornendo però aggiuntivi spunti di riflessione, quale per esempio l'inutilità dei tamponi culturali ai fini della diagnosi di infezione (Guerado et al, 2019). Fonte: Review

Un RCT sulla gestione dei Pin Sites nelle fratture dell'omero nella popolazione pediatrica ha effettuato la comparazione di tre metodi di cura dei Pin Sites: medicazione giornaliera, a giorni alterni o settimanale (*Lu et al, 2017*). Ogni gruppo era composto da 45 bambini e di essi 48 hanno avuto PTIs (35.6%) (*Lu et al, 2017*). La procedura di cura dei Pin Sites era: 1) irrigazione con soluzione salina, 2) asciugatura con tampone sterili, 3) rimozione delle croste dai siti, 4) applicazione di garze sterili attorno ai Pin Sites, 5) applicazione di medicazioni morbide attorno ai Pin Sites. I risultati non hanno dimostrato alcuna differenza nei tassi di infezione nei

tre distinti gruppi (p>0.05) anche se il dolore riportato nei tre gruppi era maggiore nel primo (medicazione giornaliera) (*Lu et al, 2017*). Gli autori concludono sostenendo che questo RCT ha dei limiti legati al numero dei partecipanti (piccolo) e al fatto che la cecità non è stata inclusa nello studio (*Lu et al, 2017*). **Fonte: RCT**

Jennison e collaboratori hanno svolto una revisione considerando le potenziali future e correnti strategie per ridurre le PTIs (Jennison et al, 2014). Una infezione si sviluppa quando i batteri planctonici presenti sulla cute aderiscono al metallo creando il biofilm e proteggendo in questo modo i batteri dalle difese dell'ospite (Jennison et al, 2014). Gli autori hanno utilizzato la classificazione di Checketts and Otterburn per la valutazione delle infezioni, ritenuta secondo gli stessi la più attendibile (vedi tabella):

Grade	Clinical appearance
1	Slight redness - Little discharge
2	Redness - Discharge - Soft-tissue pain
	and tenderness
3	Grade 2 not responding to treatment
4	Soft-tissue infection involving several
	pins
5	Osteomyelitis
6	Breakdown and discharge after the
	completion of treatment
	Bone sequestrum

Viene riportato che le infezioni minori possono essere trattate con antibiotici ma spesso senza successo e con rischi di resistenze e complicanze sistemiche (Jennison et al, 2014). Nel caso la terapia antibiotica e locale sia inefficace, il Gold Standard risulta essere la rimozione dei fissatori (Jennison et al, 2014). La revisione ha considerato in particolare l'impiego di materiali sviluppati in commercio per la riduzione delle infezioni, in particolare sono stati valutati: 1) fissatori in titanio e loro presunte capacità di limitare l'adesione dei batteri con conclusione di mancanza di studi in vivo, 2) acciaio inossidabile vs titanio, con outcomes negativi rispetto al titanio, 3) lega in rame, con studi contrastanti, 4) fissatori coperti di argento, con risultati poco chiari e relativo aumento della concentrazione ematica dell'argento 5) idrossiapatite, con risultati poco chiari sulla riduzione delle infezioni, 6) fissatori con copertura all'ossido nitrico avente effetto batteriostatico con evidenze limitate al suo impiego, 7) fissatori con copertura alla clorexidina e iodio con risultati sulla possibile tossicità ed effetti sulla osteointegrazione, 8) chitosano incorporato nella idrossiapatite con risultati promettenti ma scarse evidenze, 9) fissatori coperti da

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antibiotici con risultati promettenti ma pochi studi in vivo (Jennison et al, 2014). Gli autori concludono sostenendo che vi sono potenziali aree di sviluppo ma sono necessari studi in vivo ed in vitro per validare le potenzialità (Jennison et al, 2014).

Fonte: Review

Il trial randomizzato di Yuenyongviwat e collaboratori, ha comparato l'uso della sulfadiazina argentica (SA) vs garze pulite nella prevenzione delle infezioni dei fissatori in due gruppi formati rispettivamente da 15 persone, 30 soggetti in tutto, senza riscontrare alcuna differenza nei tassi di infezione concludendo che la SA non minimizza in alcun modo la prevalenza di infezioni (Yuenyongviwat et al, 2011) Fonte: RCT.

Un altro RCT ha comparato le garze impregnate di PHMB vs garze semplici impregnate di soluzione fisiologica per la prevenzione delle infezioni dei fissatori, nello specifico 22 pazienti nel gruppo sperimentale vs 18 nel gruppo di controllo (Lee et al, 2012). I risultati in questo RCT forniscono conclusioni interessanti poiché il gruppo trattato con il PHMB ha avuto una minor prevalenza di infezioni rispetto al controllo sebbene gli autori riferiscano esplicitamente che lo studio ha delle limitazioni. (Lee et al, 2012). Fonte: RCT

L'ultimo studio rinvenuto in letteratura, un altro RCT, ha studiato l'efficacia della clorexidina al 5% combinata con l'argento sulfadiazina 1% vs la clorexidina da sola nella prevenzione delle infezioni, concludendo che la combinazione dei due antisettici è risultata statisticamente significativa nella riduzione delle infezioni (Ogbemudia et al, 2010). Anche in questo caso lo studio è di piccole dimensioni. Nota: non siamo riusciti ad avere il full text. Fonte: RCT

Discussione.

La prevenzione delle PTIs risulta essere un problema immenso per i portatori di fissatori esterni e una strategia che si basi su solide prove di efficacia è lontana dall'essere disponibile. Nella nostra revisione rapida, abbiamo elencato una serie di studi e rispettive conclusioni in merito alla gestione e ai materiali da impiegare per prevenire le infezioni, perlopiù antisettici locali, senza essere certi su quale tipo di prodotto sia il migliore da impiegare. Uno studio ha evidenziato una certa efficacia usando il PHMB rispetto alle garze imbibite di soluzione fisiologica (Lee et al, 2012), mentre un altro ha descritto la combinazione di due diversi antisettici vs uno solo dimostrando una certa superiorità dalla combinazione dei prodotti (Ogbenudia et al, 2010). A nostro avviso non è semplice giungere a conclusioni certe sulla miglior modalità da impiegare, vuoi per il tipo di studi (piccole dimensioni), vuoi per i limiti delineati dagli autori nei vari articoli.

Implicazioni per la pratica.

La cura dei fissatori è parte fondamentale del nursing vulnologico e le procedure adottate finora sembrano poco chiare. Gli articoli rinvenuti forniscono poche indicazioni per la pratica quotidiana e la revisione sistematica della Cochrane, sebbene pubblicata nel 2013 non riesce a chiarire quale sia l'intervento migliore da adottare per prevenire le infezioni (Lethaby et al, 2013). Un dato importante che deve essere sottolineato attentamente è ad esempio l'insieme di criteri per definire quando sia necessario rimuovere i fissatori, nello specifico, in uno studio viene sottolineato che dopo aver trattato l'infezione dei fissatori per via sistemica con antibiotici senza ottenere alcun successo, il Gold Standard viene considerata la rimozione dei fissatori (Jennison et al, 2014). Risulta quindi importante essere in grado di riconoscere attentamente i segni che richiedono una valutazione rapida e appropriata al fine di evitare complicazioni più importanti quali l'osteomielite o le infezioni sistemiche, avvalendosi anche del supporto multidisciplinare e usando i principi cardine nel wound care quali il TIME per la valutazione locale della ferita (Moore et al, 2019). Tra le raccomandazioni più importanti che ci sentiamo di fornire, oltre alla cura locale volta a prevenire infezioni crociate, è proprio la conoscenza nel saper riconoscere rapidamente i segni che richiedono un intervento rapido.

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Appendice A

Autore	Titolo	Abstract	Tipo di studio	Screening	Eleggibilità
1. Camilo AM, Bongiovanni JC	Evaluation of effectiveness of 10% polyvinylpyrrolidone-iodine solution against infections in wire and pin holes for Ilizarov external fixators. ao Paulo Med J. 2005 Mar 2;123(2):58-61. doi: 10.1590/s1516-31802005000200005. Epub 2005 Jun 8. PMID: 15947831.	Context and objective: Superficial infection at wire and pin insertions in the skin is a frequent disorder among patients utilizing the Ilizarov method. The objective of this study was to evaluate the effectiveness of daily topical application of 10% polyvinylpyrrolidone-iodine solution against infections of the holes for Kirschner wires and Schanz pins among patients using Ilizarov external fixators, in comparison with cleaning these holes only with 0.9% sterile physiological saline solution.	Clinical Trial	YES	YES
		Design and setting: Controlled randomized clinical trial, in the Orthopedics and Traumatology Outpatient Clinic, Hospital São Paulo, and Orthopedics and Traumatology Center of Jundiaí. Methods: 30 patients were treated using the Ilizarov technique: 15 were instructed to apply 0.9% physiological saline dressing on the wire and pin insertions and 15 to apply 0.9% physiological saline plus 10%			

 $[\]hbox{\it ``To make this world a better place for patients and family who are fighting against chronic wounds''}$

		polyvinylpyrrolidone- iodine. Patients were			
		evaluated at outpatient return visits for identification of signs			
		and symptoms of superficial infection at			
		wire and pin insertion sites. Samples were collected from cases of			
		purulent exudate secretion, for culturing and clinical tests.			
		Results: The chi- squared and Fischer exact tests were applied, but no statistically significant association between the intervention of topical polyvinylpyrrolidone-			
		iodine solution and the prevention of infections at wire and pin insertions could be found.			
		Conclusions: Topical 10% polyvinylpyrrolidone-			
		iodine solution applied daily to Kirschner wire and Schanz pin			
		insertions did not reduce the incidence of superficial infection at			
		these holes, in comparison with mechanical removal of			
		dirt using 0.9% physiological saline solution.			
2. Camilo AM, Bongiovanni JC.	Evaluation of effectiveness of 10% polyvinylpyrrolidone iodine solution against infections in wire and pin holes for Ilizarov external fixators.		Clinical Trial	YES	YES
	ao Paulo Med J. 2005 Mar 2;123(2):58-61. doi: 10.1590/s1516-31802005000200005. Epub 2005 Jun 8. PMID: 15947831.				
3. Ktistakis I, Guerado E, Giannoudis PV.	Pin-site care: can we reduce the incidence of infections? Injury. 2015 Sep;46 Suppl 3:S35-9. doi: 10.1016/S0020-1383(15)30009-7. PMID: 26458298.	Background: This study was conducted to determine the pin-site care protocols currently in use and to analyse their effectiveness and outcomes.	Review	YES	YES N
		outcomes.			

		Methods: PubMed, the			
		Cochrane Library and			
		Embase databases were			
		screened for			
		manuscripts that			
		described comparative			
		studies of different			
		methods of pin-site			
		care and referred to			
		complications related			
		to any kind of external			
		fixator application.			
		Results: A total of 369			
		manuscripts were			
		screened and only 13 of			
		these met the inclusion			
		criteria evaluating			
		different protocols of			
		pin-site care. This			
		review is based on a			
		total of 574 patients.			
		Infection rates were			
		very variable depending			
		on the type of implant			
		used and the protocol			
		of pin-site care applied.			
		Conclusions: None of			
		the different protocols			
		of pin-site care that			
		were evaluated in this			
		study were associated			
		with a 0% infection			
		rate. There is currently			
		no consensus in the			
		international literature			
		about which protocol			
		should be applied			
		universally. Meticulous			
		surgical technique			
		during pin insertion and			
		implementation of one			
		protocols of pin-site			
		care are the mainstay of			
		prevention and/or			
		reduction of the			
		incidence of pin-site			
		infections.			
4. Lethaby A, Temple J, Santy-	Pin site care for preventing infections	Background: Metal pins	Review	YES	YES V
Tomlinson J.	associated with external bone fixators	are used to apply			
z ommioon j.	and pins. Cochrane Database Syst Rev.	skeletal traction or			
	2013 Dec 3;(12):CD004551. doi:				
	10.1002/14651858.CD004551.pub3.	devices in the			
	PMID: 24302374.	management of			
		orthopaedic fractures.			
		These percutaneous			
		pins protrude through			1

the skin, and the way in
which they are treated
after insertion may
affect the incidence of
pin site infection. This
review set out to
summarise the evidence
of pin site care on
infection rates.
Objectives: To assess
the effect on infection
rates of different
methods of cleansing
and dressing
orthopaedic
percutaneous pin sites.
Search methods: In
Search methods: In September 2013, for
this third update, we
searched the Cochrane
Wounds Group
Specialised Register;
The Cochrane Central
Register of Controlled
Trials (CENTRAL)
(The Cochrane
Library); Ovid
MEDLINE; Ovid
MEDLINE (In-
Process & Other Non-
Indexed Citations);
Ovid EMBASE; and
EBSCO CINAHL.
Selection criteria: We
evaluated all
randomised controlled
trials (RCTs) that
compared the effect on
infection and other
complication rates of
different methods of
cleansing or dressing orthopaedic
percutaneous pin sites.
percutaneous pin sites.
Data collection and
analysis: Two review
authors independently
assessed the citations
retrieved by the search
strategies for reports of
relevant RCTs, then
independently selected
trials that satisfied the
inclusion criteria,
extracted data and

	undertook quality
	assessment.
	Main results: A total of
	`
	participants) were
	eligible for inclusion in
	the review but not all
	participants
	contributed data to
	each comparison.
	Three trials compared a
	cleansing regimen
	(saline, alcohol,
	hydrogen peroxide or
	antibacterial soap) with
	no cleansing
	(application of a dry
	dressing), three trials
	compared alternative
	sterile cleansing
	solutions (saline,
	alcohol, peroxide,
	povidone iodine), three
	trials compared
	methods of cleansing
	(one trial compared
	identical pin site care
	performed daily or
	weekly and the two
	others compared sterile
	with non sterile
	techniques), one trial
	compared daily pin site
	care with no care and
	six trials compared
	different dressings
	(using different
	solutions/ointments
	and dry and
	impregnated gauze or
	sponges). One small
	blinded study of 38
	patients found that the
	risk of pin site infection
	was significantly
	reduced with
	polyhexamethylene
	biguanide (PHMB)
	gauze when compared
	to plain gauze (RR 0.23,
	95% CI 0.12 to 0.44)
	(infection rate of 1% in
	the PHMB group and
	4.5% in the control
	group) but this study
	was at high risk of bias
	as the unit of analysis
	was observations rather
<u> </u>	<u> </u>

		than patients. There			
		were no other statistically significant			
		differences between			
		groups in any of the other trials.			
		Authors' conclusions: The available trial			
		evidence was not			
		extensive, was very heterogeneous and			
		generally of poor			
		quality, so there was			
		insufficient evidence to be able to identify a			
		strategy of pin site care			
		that minimises infection rates.			
		Adequately-powered			
		randomised trials are			
		required to examine the effects of different pin			
		care regimens, and co-			
		interventions - such as antibiotic use - and			
		other extraneous			
		factors must be controlled in the study			
		designs.			
5. Subramanyam KN,	No role for antiseptics in routine pin	Introduction: Pin site	RCT	YES	YES V
5. Subramanyam KN, Mundargi AV, Potarlanka R, Khanchandani P.	No role for antiseptics in routine pin site care in Ilizarov fixators: A randomised prospective single blinded		RCT	YES	YES V
Mundargi AV, Potarlanka R,	site care in Ilizarov fixators: A randomised prospective single blinded control study. Injury. 2019	Introduction: Pin site infection is the commonest complication of	RCT	YES	YES N
Mundargi AV, Potarlanka R,	site care in Ilizarov fixators: A randomised prospective single blinded control study. Injury. 2019 Mar;50(3):770-776. doi:	Introduction: Pin site infection is the commonest complication of Ilizarov external	RCT	YES	YES 1
Mundargi AV, Potarlanka R,	site care in Ilizarov fixators: A randomised prospective single blinded control study. Injury. 2019	Introduction: Pin site infection is the commonest complication of Ilizarov external fixation. The aim of the study was to examine if	RCT	YES	YES V
Mundargi AV, Potarlanka R,	site care in Ilizarov fixators: A randomised prospective single blinded control study. Injury. 2019 Mar;50(3):770-776. doi: 10.1016/j.injury.2019.01.031. Epub	Introduction: Pin site infection is the commonest complication of Ilizarov external fixation. The aim of the study was to examine if use of antiseptics was	RCT	YES	YES V
Mundargi AV, Potarlanka R,	site care in Ilizarov fixators: A randomised prospective single blinded control study. Injury. 2019 Mar;50(3):770-776. doi: 10.1016/j.injury.2019.01.031. Epub	Introduction: Pin site infection is the commonest complication of Ilizarov external fixation. The aim of the study was to examine if use of antiseptics was superior over control and further if daily	RCT	YES	YES V
Mundargi AV, Potarlanka R,	site care in Ilizarov fixators: A randomised prospective single blinded control study. Injury. 2019 Mar;50(3):770-776. doi: 10.1016/j.injury.2019.01.031. Epub	Introduction: Pin site infection is the commonest complication of Ilizarov external fixation. The aim of the study was to examine if use of antiseptics was superior over control and further if daily dressing was superior	RCT	YES	YES V
Mundargi AV, Potarlanka R,	site care in Ilizarov fixators: A randomised prospective single blinded control study. Injury. 2019 Mar;50(3):770-776. doi: 10.1016/j.injury.2019.01.031. Epub	Introduction: Pin site infection is the commonest complication of Ilizarov external fixation. The aim of the study was to examine if use of antiseptics was superior over control and further if daily dressing was superior to weekly dressing in	RCT	YES	YES V
Mundargi AV, Potarlanka R,	site care in Ilizarov fixators: A randomised prospective single blinded control study. Injury. 2019 Mar;50(3):770-776. doi: 10.1016/j.injury.2019.01.031. Epub	Introduction: Pin site infection is the commonest complication of Ilizarov external fixation. The aim of the study was to examine if use of antiseptics was superior over control and further if daily dressing was superior to weekly dressing in regular pin site care in reducing the burden of	RCT	YES	YES V
Mundargi AV, Potarlanka R,	site care in Ilizarov fixators: A randomised prospective single blinded control study. Injury. 2019 Mar;50(3):770-776. doi: 10.1016/j.injury.2019.01.031. Epub	Introduction: Pin site infection is the commonest complication of Ilizarov external fixation. The aim of the study was to examine if use of antiseptics was superior over control and further if daily dressing was superior to weekly dressing in regular pin site care in	RCT	YES	YES N
Mundargi AV, Potarlanka R,	site care in Ilizarov fixators: A randomised prospective single blinded control study. Injury. 2019 Mar;50(3):770-776. doi: 10.1016/j.injury.2019.01.031. Epub	Introduction: Pin site infection is the commonest complication of Ilizarov external fixation. The aim of the study was to examine if use of antiseptics was superior over control and further if daily dressing was superior to weekly dressing in regular pin site care in reducing the burden of pin site infection in Ilizarov fixators.	RCT	YES	YES V
Mundargi AV, Potarlanka R,	site care in Ilizarov fixators: A randomised prospective single blinded control study. Injury. 2019 Mar;50(3):770-776. doi: 10.1016/j.injury.2019.01.031. Epub	Introduction: Pin site infection is the commonest complication of Ilizarov external fixation. The aim of the study was to examine if use of antiseptics was superior over control and further if daily dressing was superior to weekly dressing in regular pin site care in reducing the burden of pin site infection in Ilizarov fixators.	RCT	YES	YES N
Mundargi AV, Potarlanka R,	site care in Ilizarov fixators: A randomised prospective single blinded control study. Injury. 2019 Mar;50(3):770-776. doi: 10.1016/j.injury.2019.01.031. Epub	Introduction: Pin site infection is the commonest complication of Ilizarov external fixation. The aim of the study was to examine if use of antiseptics was superior over control and further if daily dressing was superior to weekly dressing in regular pin site care in reducing the burden of pin site infection in Ilizarov fixators. Patients and methods: A total of 114 patients (2363 pin sites) were	RCT	YES	YES V
Mundargi AV, Potarlanka R,	site care in Ilizarov fixators: A randomised prospective single blinded control study. Injury. 2019 Mar;50(3):770-776. doi: 10.1016/j.injury.2019.01.031. Epub	Introduction: Pin site infection is the commonest complication of Ilizarov external fixation. The aim of the study was to examine if use of antiseptics was superior over control and further if daily dressing was superior to weekly dressing in regular pin site care in reducing the burden of pin site infection in Ilizarov fixators. Patients and methods: A total of 114 patients (2363 pin sites) were randomised to receive	RCT	YES	YES
Mundargi AV, Potarlanka R,	site care in Ilizarov fixators: A randomised prospective single blinded control study. Injury. 2019 Mar;50(3):770-776. doi: 10.1016/j.injury.2019.01.031. Epub	Introduction: Pin site infection is the commonest complication of Ilizarov external fixation. The aim of the study was to examine if use of antiseptics was superior over control and further if daily dressing was superior to weekly dressing in regular pin site care in reducing the burden of pin site infection in Ilizarov fixators. Patients and methods: A total of 114 patients (2363 pin sites) were randomised to receive regular pin site care alone (30 patients, 638	RCT	YES	YES N
Mundargi AV, Potarlanka R,	site care in Ilizarov fixators: A randomised prospective single blinded control study. Injury. 2019 Mar;50(3):770-776. doi: 10.1016/j.injury.2019.01.031. Epub	Introduction: Pin site infection is the commonest complication of Ilizarov external fixation. The aim of the study was to examine if use of antiseptics was superior over control and further if daily dressing was superior to weekly dressing in regular pin site care in reducing the burden of pin site infection in Ilizarov fixators. Patients and methods: A total of 114 patients (2363 pin sites) were randomised to receive regular pin site care alone (30 patients, 638 pin sites) or with	RCT	YES	YES
Mundargi AV, Potarlanka R,	site care in Ilizarov fixators: A randomised prospective single blinded control study. Injury. 2019 Mar;50(3):770-776. doi: 10.1016/j.injury.2019.01.031. Epub	Introduction: Pin site infection is the commonest complication of Ilizarov external fixation. The aim of the study was to examine if use of antiseptics was superior over control and further if daily dressing was superior to weekly dressing in regular pin site care in reducing the burden of pin site infection in Ilizarov fixators. Patients and methods: A total of 114 patients (2363 pin sites) were randomised to receive regular pin site care alone (30 patients, 638	RCT	YES	YES
Mundargi AV, Potarlanka R,	site care in Ilizarov fixators: A randomised prospective single blinded control study. Injury. 2019 Mar;50(3):770-776. doi: 10.1016/j.injury.2019.01.031. Epub	Introduction: Pin site infection is the commonest complication of Ilizarov external fixation. The aim of the study was to examine if use of antiseptics was superior over control and further if daily dressing was superior to weekly dressing in regular pin site care in reducing the burden of pin site infection in Ilizarov fixators. Patients and methods: A total of 114 patients (2363 pin sites) were randomised to receive regular pin site care alone (30 patients, 638 pin sites) or with additional application of povidone iodine (27 patients, 561 pin sites),	RCT	YES	YES
Mundargi AV, Potarlanka R,	site care in Ilizarov fixators: A randomised prospective single blinded control study. Injury. 2019 Mar;50(3):770-776. doi: 10.1016/j.injury.2019.01.031. Epub	Introduction: Pin site infection is the commonest complication of Ilizarov external fixation. The aim of the study was to examine if use of antiseptics was superior over control and further if daily dressing was superior to weekly dressing in regular pin site care in reducing the burden of pin site infection in Ilizarov fixators. Patients and methods: A total of 114 patients (2363 pin sites) were randomised to receive regular pin site care alone (30 patients, 638 pin sites) or with additional application of povidone iodine (27	RCT	YES	YES

and chlorhexidine (30 patients, 594 pin sites). The pin tracts were sub-randomised receive daily (1212 pin sites) or weekly (1151 pin sites) dressings. The primary outcome was pin site infection days rate across all four groups. The secondary outcomes were - mean duration to first episode of infection, differences between daily and weekly dressing groups, mean duration of antibiotic therapy and incidence of reinterventions and sequelae. We also recorded frequency of bacterial pathogens in all microbiological samples submitted. Block randomization using computergenerated random numbers was used. The assessor of outcome was blinded. Results: All patients completed the study. Pin site infection rate days per 1000 pin site days observed was marginally less in chlorhexidine group, but was not statistically significant compared to other antiseptics and control group (Absolute value in control, povidone iodine, silver sulphadiazine and chlorhexidine groups were respectively 2.04 \pm 4.27, 2.04 \pm 3.65, $1.85 \pm 3.37, 1.37 \pm$ 2.35, p value 0.92). Daily dressing category showed slightly less pin site infection days rate within each group and overall, but this was also not statistically significant (1.56 \pm 3.99

		versus 2.10 ± 5.1, p			
		value 0.35). There was no statistically			
		significant difference			
		among the groups with			
		regard to other			
		secondary outcomes.			
		Methicillin Sensitive			
		Staphylococcus aureus			
		was the most common			
		bacterial pathogen			
		isolated.			
		1001acca.			
		Conclusion: Use of			
		antiseptics does not			
		offer any advantage in			
		regular pin site care in			
		Ilizarov external			
		fixation and daily pin			
		site care is not superior			
		to weekly pin site care.			
		Empirical therapy in			
		early and low grade pin			
		site infections must be			
		targeted against			
		Staphylococcus.			
6. Georgiades DS.	A Systematic Integrative Review of Pin	There continues to be a	Review	YES	YES $\sqrt{}$
	Site Crusts. Orthop Nurs. 2018	lack of knowledge in			
	Jan/Feb;37(1):36-42. doi:	the overall management			
	10.1097/NOR.00000000000000416.	of pin site crusts for			
	PMID: 29369133.	orthopaedic clinicians			
		to make evidence-based decisions on their			
		retention or removal.			
		The goal of pin site care is to reduce, or where			
		possible, prevent pin			
		site infection.			
		Understanding the role			
		of pin site crusts in the			
		management of the pin			
		site and prevention of			
		pin site infection is			
		important. The aim of			
		this systematic			
		integrative review is to			
		explore the			
		effectiveness of pin site			
		crusts as a biological			
		dressing versus the			
		removal of pin site			
		crusts in pin site care			
		and prevention of pin			
				i l	
		site infection. Three			
		electronic databases			
		electronic databases were used to conduct a			
		electronic databases were used to conduct a systematic search. The			
		electronic databases were used to conduct a			

		inclusion criteria were			
		appraised using the			
		Mixed Method			
		appraisal Tool.			
		Findings reveal that pin			
		site crusts have similar			
		properties to that of a			
		dressing, as the crusts			
		are able to act as a			
		barrier between the			
		insertion site of the pin			
		and external			
		environment, which			
		can reduce infection.			
		Additional high-quality			
		evidence is required to			
		solidify the			
		effectiveness of pin site			
		crusts as a biological			
7 0/ 11/340 1/01	A D 1 1 1 01 1 1 m 1	dressing.	D.CT	VEC	VEC -
7. Sáenz-Jalón M, Sarabia-Cobo	A Randomized Clinical Trial on the	Pin-site infections	RCT	YES	YES $\sqrt{}$
CM, Roscales Bartolome E,	Use of Antiseptic Solutions for the	remain a common			
Santiago Fernández M, Vélez	Pin-Site Care of External Fixators:	clinical complication in			
B, Escudero M, Miguel ME,	Chlorhexidine-Alcohol Versus	patients with external			
Artabe P, Cabañas I,	Povidone-Iodine. J Trauma Nurs.	fixators. Pin-site care is			
Fernández A, Garcés C,	2020 May/Jun;27(3):146-150. doi:	commonly performed			
Couceiro J.	10.1097/JTN.0000000000000503.	with either			
·	PMID: 32371731.	chlorhexidine-alcohol			
		solution or povidone-			
		iodine solution. This			
		study aimed to			
		investigate the			
		superiority of			
		chlorhexidine-alcohol			
		solution versus			
		povidone-iodine			
		solution for external			
		fixator pin-site care in			
		pin-site infection. This			
		prospective			
		randomized clinical trial			
		using an open, parallel-			
		group design was			
		conducted in a single			
		Spanish hospital.			
		Eligible consenting			
		patients from			
		November 2018 to May			
		2019 who underwent			
		placement of an			
		external fixator were			
		included. Patients were			
		randomly assigned to			
		receive pin-site care			
		using either a 2%			
		chlorhexidine-alcohol			
		solution or a 10%			
		povidone-iodine			
		solution. The primary			
		solution. The primary			l l

endpoint was the development of a pin-size infection. In total, 568 pins were analyzed (128 patients, with a mean of 4.3 pins per patient). No significant differences were found between groups. However, staristically significant differences were found between groups. However, staristically significant differences were found regarding time and infection variables. The longer the person had the finator, the higher the risk of infection, (x) = 5.49, p = .002. Both chlorhexadime-alcohol and powlodne-lodine solutions are equally effective anisteptic agents for the prevention of infections in external fixations. Alms Pin-site infection are additional versus an emollient skiracre regimen for the care of pin-sites in patients with circular frames. Bone joint J. 2021 Februlos Algo2279-285. doi: 10.1302/0301-620X.10382.Blj-2020-0689.Rl. PMID: 35517738. 8. Fenguson D, Harwood P, The PINS Trial: a prospective analysis of the prevention of infections in external fixations. A randomized trial comparing a raditional versus an emollient skiracre regimen for the care of pin-sites in patients with circular frames. Bone joint J. 2021 Februlos Algo2279-285. doi: 10.1302/0301-620X.10382.Blj-2020-0689.Rl. PMID: 35517738. 8. Fenguson D, Harwood P, The PINS Trial: a prospective analysis of the prevention of infections in external fixations. A randomized to infection in the properties of the prevention of infections in external fixation. A randomized to infection with a tibial fixation of patients were randomized to use either 0.5% CHA or Dermol (DMI), 500 emolbient pin site care. A skin biopsy was taken from the tibia during surgery to measure the dermal and epidermal thickness and capillary,
macrophage, and T-cell counts per high- powered field. The pH and hydration of the

site infection occurred.
Pin-site infection was
defined using a
validated clinical
system.
System.
Daniles Out of 116
Results: Out of 116
patients who were
enrolled in the study, 23
patients (40%) in the
CHX group and 26
(44%) in the DML
group had at least one
bad or ugly pin-site
infection. This
difference was not
statistically significant
(p = 0.71). There was
no significant
relationship between
pH or hydration of the
skin and pin-site
infection. The
epidermal thickness
was found to be
significantly greater in
patients who had a pin-
site infection compared
with those who did not
$\begin{array}{ccc} (p & = & 0.01). & Skin \end{array}$
irritation requiring a
change of treatment
occurred in four
patients (7%) using
CHX, and none using
DML.
Conclusion: We found
no significant
no significant difference in the
incidence of pin-site
infection between the
CHX and DML
treatment groups.
Dermol appeared to
offer a small but
significant advantage in
terms of tolerability.
We did not find a
significant association
between patient or
treatment related
factors and pin-site
infection. It is therefore
difficult to make
specific
recommendations
based upon these
results. The use of

gicher cleaning agent appears to be appropriate. Circ his arrecle: Bone Joint J. 2022;103-84(222-20-285. doi: 10.1016/j.impsy.2012.08.010. Epub 2012 Aug 16. PMID: 22901422. 9. Camathias C, Valderrabano K, V. Obedi II. 9. Camathias C, Valderrabano E, Santano E, S		sithan alsoning asset			
9. Carmuthias C, Valdernabano V, Obedi H. Routine pin tract care in external fixation is unnecessary: a randomised, prospective, bilinded controlled study, Imjury. 2012 Awg 3(1):1907-73. doi: 10.1016/j.joury.2012.08.010. Fepth 2012 Aug 16. PMID: 22901422. 10.11 Aug. 10. PMID: 22901422. 10. The study of the first inter-subject and infection prevention. This study is the first inter-subject, randomised, prospective controlled trail computing daily pin tract care to no pon tract care at all. 10. Method: Consecutive patients seekes (56 patients, 16 female, age 4-08 y, mein 24 y, in total 29 painy exertited in the National Referral Hospital in Horisan in the Solumon Islands over a 2 year period. Exclusion or feefs, but no feefs Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 1 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period. Exclusion or feefs Solumon Islands over a 2 year period	l l				
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ExFix. Pin treatment was allocated into groups anatomically, proximal and distal. Randomisation was intra-subject and intra- group: 101 pins had daily pin site care and 103 had no treatment at all. Endpoints: Soft-tissue interface, stability of the pins, torsional stability as determined with a torque metre, osteolysis and pain. Assessment of pin sites blinded. Statistical analysis using		for less than two weeks			
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groups anatomically, proximal and distal. Randomisation was intra-subject and intra-group: 101 pins had daily pin site care and 103 had no treatment at all. Endpoints: Soft-tissue interface, stability of the pins, torsional stability as determined with a torque metre, osteolysis and pain. Assessment of pin sites blinded. Statistical analysis using					
proximal and distal. Randomisation was intra-subject and intra- group: 101 pins had daily pin site care and 103 had no treatment at all. Endpoints: Soft-tissue interface, stability of the pins, torsional stability as determined with a torque metre, osteolysis and pain. Assessment of pin sites blinded. Statistical analysis using					
Randomisation was intra-subject and intra-group: 101 pins had daily pin site care and 103 had no treatment at all. Endpoints: Soft-tissue interface, stability of the pins, torsional stability as determined with a torque metre, osteolysis and pain. Assessment of pin sites blinded. Statistical analysis using					
intra-subject and intragroup: 101 pins had daily pin site care and 103 had no treatment at all. Endpoints: Soft-tissue interface, stability of the pins, torsional stability as determined with a torque metre, osteolysis and pain. Assessment of pin sites blinded. Statistical analysis using					
group: 101 pins had daily pin site care and 103 had no treatment at all. Endpoints: Soft-tissue interface, stability of the pins, torsional stability as determined with a torque metre, osteolysis and pain. Assessment of pin sites blinded. Statistical analysis using					
daily pin site care and 103 had no treatment at all. Endpoints: Soft-tissue interface, stability of the pins, torsional stability as determined with a torque metre, osteolysis and pain. Assessment of pin sites blinded. Statistical analysis using					
Endpoints: Soft-tissue interface, stability of the pins, torsional stability as determined with a torque metre, osteolysis and pain. Assessment of pin sites blinded. Statistical analysis using					
all. Endpoints: Soft-tissue interface, stability of the pins, torsional stability as determined with a torque metre, osteolysis and pain. Assessment of pin sites blinded. Statistical analysis using					
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interface, stability of the pins, torsional stability as determined with a torque metre, osteolysis and pain. Assessment of pin sites blinded. Statistical analysis using					
pins, torsional stability as determined with a torque metre, osteolysis and pain. Assessment of pin sites blinded. Statistical analysis using					
as determined with a torque metre, osteolysis and pain. Assessment of pin sites blinded. Statistical analysis using					
torque metre, osteolysis and pain. Assessment of pin sites blinded. Statistical analysis using					
and pain. Assessment of pin sites blinded. Statistical analysis using					
of pin sites blinded. Statistical analysis using					
Statistical analysis using					
the paired t test for					
		the paired t test for			
parametric data and the		parametric data and the			

		Wilcoxon rank test for			
		non-parametric data			
		(Stat View).			
		Results: No significant			
		difference between the			
		two groups. Soft-tissue			
		interface 36% vs. 35%			
		(granulation/secretion),			
		stability 20 vs 25 pins			
		with loosening. No			
		significant osteolysis (7			
		vs. 6 pins). Torque:			
		mean 0.75 Nm, max.:			
		3.05 Nm vs. 0.60 Nm,			
		max.: 3.55 Nm, no			
		significant difference.			
		No differences in			
		demographics (age,			
		localisation, sex, time of			
		fixation).			
		Conclusion: This study			
		shows that routine pin			
		tract care is unnecessary			
		in external fixation			
		treatment of injuries.			
10. Guerado E, Cano JR,	Pin tract infection prophylaxis and	Pin tract infection in	Review	YES	YES √
Fernandez-Sanchez F.	treatment. Injury. 2019 Jun;50 Suppl	external fixation			
	1:S45-S49. doi:	(ExFix) is a frequent			
		(ExFix) is a frequent finding which can			
	10.1016/j.injury.2019.03.044. Epub	finding which can			
		finding which can eventually lead to			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening,			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The first is limited to soft			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The first is limited to soft tissues, whereas the			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The first is limited to soft tissues, whereas the latter includes bone			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The first is limited to soft tissues, whereas the latter includes bone involvement. The rate			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The first is limited to soft tissues, whereas the latter includes bone involvement. The rate of infection after			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The first is limited to soft tissues, whereas the latter includes bone involvement. The rate of infection after conversion of external			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The first is limited to soft tissues, whereas the latter includes bone involvement. The rate of infection after conversion of external fixation			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The first is limited to soft tissues, whereas the latter includes bone involvement. The rate of infection after conversion of external fixation to intramedullary nailing			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The first is limited to soft tissues, whereas the latter includes bone involvement. The rate of infection after conversion of external fixation to intramedullary nailing (IMN) is not well			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The first is limited to soft tissues, whereas the latter includes bone involvement. The rate of infection after conversion of external fixation to intramedullary nailing (IMN) is not well known. Unfortunately,			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The first is limited to soft tissues, whereas the latter includes bone involvement. The rate of infection after conversion of external fixation to intramedullary nailing (IMN) is not well known. Unfortunately, papers referring to			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The first is limited to soft tissues, whereas the latter includes bone involvement. The rate of infection after conversion of external fixation to intramedullary nailing (IMN) is not well known. Unfortunately, papers referring to infection after the			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The first is limited to soft tissues, whereas the latter includes bone involvement. The rate of infection after conversion of external fixation to intramedullary nailing (IMN) is not well known. Unfortunately, papers referring to infection after the conversion of ExFix to			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The first is limited to soft tissues, whereas the latter includes bone involvement. The rate of infection after conversion of external fixation to intramedullary nailing (IMN) is not well known. Unfortunately, papers referring to infection after the conversion of ExFix to intramedullary nailing			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The first is limited to soft tissues, whereas the latter includes bone involvement. The rate of infection after conversion of external fixation to intramedullary nailing (IMN) is not well known. Unfortunately, papers referring to infection after the conversion of ExFix to			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The first is limited to soft tissues, whereas the latter includes bone involvement. The rate of infection after conversion of external fixation to intramedullary nailing (IMN) is not well known. Unfortunately, papers referring to infection after the conversion of ExFix to intramedullary nailing (IMN) are of evidence level IV or V. It is			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The first is limited to soft tissues, whereas the latter includes bone involvement. The rate of infection after conversion of external fixation to intramedullary nailing (IMN) is not well known. Unfortunately, papers referring to infection after the conversion of ExFix to intramedullary nailing (IMN) are of evidence level IV or V. It is			
	10.1016/j.injury.2019.03.044. Epub	finding which can eventually lead to loosening, osteomyelitis and loss of fixation. Its diagnosis is based on high empiricism and low validity, although it is possible to distinguish between minor and major infection. The first is limited to soft tissues, whereas the latter includes bone involvement. The rate of infection after conversion of external fixation to intramedullary nailing (IMN) is not well known. Unfortunately, papers referring to infection after the conversion of ExFix to intramedullary nailing (IMN) are of evidence level IV or V. It is			

		IMN should be carried			
		out in a 2 step regimen.			
		The time interval of 2			
		step regimen is			
		uncertain although			
		some authors have			
		recommended to occur			
		within 9 days. There is			
		no consensus as to			
		which prophylaxis			
		protocol should be			
		applied prior to			
		conversion. In order to			
		throw more light into			
		this important issue,			
		registries capturing			
		important related			
		parameters to the			
		development of			
		infection should be			
		established.			
11. Lu D, Wang T, Chen H, Sun	Management of pin tract infection in	The objective of this	RCT	YES	YES √
	pediatric supracondylar humerus	_ ′	NO1	1120	TEO N
LJ.	fractures: a comparative study of three	study was to prospectively compare			
	methods. Eur J Pediatr. 2017	the incidence of pin			
	May;176(5):615-620. doi:	tract infection in			
	10.1007/s00431-017-2884-1. Epub	pediatric supracondylar			
	2017 Mar 1. PMID: 28251295.	humerus fractures			
		managed with pin care			
		daily or every other day			
		or weekly. We			
		hypothesized that there			
		were some differences			
		between these three			
		methods. From June			
		2012 to May 2015, 135			
		children with			
		supracondylar humerus			
		fractures were			
		randomized to			
		postoperative pin care			
		by cleaning pin tracts			
		daily (group A, 45			
		cases) or cleaning every			
		2 days (group B, 45			
		cases) or cleaning			
		weekly (group C, 45			
		cases). The three			
		groups were			
		comparable with			
		respect to age, gender,			
		affected side, body			
		mass index (BMI),			
		fracture type, injury to			
		surgery time, number			
		of intraoperative			
		percutaneous pinning,			
		and follow-up time. We			
		collected data on pin			
		conected data on pin			

retention time, union
time, and pin tract
infection. The average
follow-up time of
group A was 4.5 ± 1.3
and 4.2 ± 1.6 months in
group B and 4.3 ± 1.4
months in group C. The
patient demographics
and intraoperative
variables of three
groups were
comparable. No
significant difference
between these three
groups was found in
union time and pin
fixation time. Of the
135 children, 48
(35.6%) cases had pin
tract infection. Grade I
infections (Checketts-
Otterburns
classification) occurred
around 28.9% of 270
pin and grade II around
6.7%. We found no
differences between
three groups as regards
frequency and severity
of pin tract infections
(both P > 0.05).
However, complain of
pain was more frequent
in group A than other
two groups ($P < 0.05$).
two groups (1 < 0.03).
Conducional All of the
Conclusions: All of the
three methods were
effective for the
management of pin site
infection in pediatric
supracondylar humerus
fractures. However,
excessive frequent care
as well as pin care daily
had the disadvantages
of child's fear and
parental anxiety. What
is Known: • Pin site
infection is a common
complication after
fracture fixation and
bone lengthening using
percutaneous pins or
reduction and
percutaneous K-wires
fixation are the

		mainstay of treatment			
		in pediatric			
		supracondylar humeral			
		fractures. What is New:			
		• All of the three			
		methods were effective			
		for the management of			
		pin site infection. •			
		Excessive frequent care			
		as well as pin care daily			
		has the disadvantages			
		of child's fear and			
		parental anxiety.			
12. Suson KD, Sponseller PD,	Bony abnormalities in classic bladder	Introduction: As the	Review	YES	NO
Gearhart JP.	exstrophy: the urologist's perspective. J	primary practitioner			
	Pediatr Urol. 2013 Apr;9(2):112-22.	managing patients with			
	doi: 10.1016/j.jpurol.2011.08.007.	classic bladder			
	Epub 2011 Nov 21. PMID: 22105005.	exstrophy (CBE), it is			
		incumbent upon the			
		pediatric urologist to			
		understand the			
		associated orthopedic			
		anomalies and their			
		management.			
		Methods: A Pubmed			
		search was performed			
		with the keyword			
		exstrophy. Resulting			
		literature pertaining to			
		orthopedics and			
		published references			
		were reviewed.			
		Results: Anatomic			
		changes to the bony			
		pelvis include outward			
		rotation, acetabular			
		retroversion with			
		compensatory femoral			
		anteversion, anterior			
		pubic shortening, and			
		pubic diastasis. Imaging			
		options have improved,			
		which impacts surgical			
		planning. Surgical			
		approach, including			
		type of osteotomy and			
		method of pubic			
		approximation, is			
		evolving. Most centers			
		employ immobilization			
		after surgery, with			
		external fixation,			
		Bryant's traction,			
		Buck's traction, and			
		spica casting being the			
		most common			
		methods. Orthopedic			

		complications range	·		. <u></u>
		from minor pin-site			
		infections to neurologic			
		and vascular			
		compromise. Most			
		experts agree			
		osteotomy aids bladder			
		closure beyond 72 h of			
		life, but effect on			
		continence remains			
		controversial. Although			
		no significant			
		orthopedic benefit has			
		been expounded, it may			
		be too early to			
		appreciate			
		improvement in			
		frequency or severity of			
		osteoarthritis or hip			
		dysplasia.			
		C1: W1 1			
		Conclusion: While			
		orthopedic surgeons			
		remain vital to			
		managing exstrophy			
		patients, knowledge of			
		the anatomy, imaging,			
		surgical approaches,			
		and immobilization			
		enable effective			
		communication with			
		parents and other			
		physicians, improving			
		care for these			
		complicated patients.			
13. Pieske O, Kaltenhauser F,	Clinical benefit of hydroxyapatite-	Background: The	RCT	YES	NO
Pichlmaier L, Schramm N,	coated pins compared with stainless	purpose of this study			
Trentzsch H, Löffler T,	steel pins in external fixation at the	was to determine the			
Greiner A, Piltz S.	wrist: a randomised prospective study.	clinical benefit of			
	Injury. 2010 Oct;41(10):1031-1036.	hydroxyapatite (HA)-			
	doi: 10.1016/j.injury.2010.03.030.	coated pins compared			
	PMID: 20444448.	with standard stainless			
	1 11112. 20111110.	steel pins in external			
		fixators applied for			
		unstable fractures of			
		the distal radius.			
		the thistal facility.			
		Methods: A total of 40			
		patients (160 pins) with			
		unstable wrist fractures			
		were randomised for			
		uniplanar fixator			
		treatment with the use			
		of identically designed,			
		commercially available			
		pins either composed			
		of stainless steel (steel			
,		\ (- 20\			
		group) (n = 20) or			
		group) $(n = 20)$ or coated by			

hydroxyapatite (HA
group) (n = 20). Each
pin site was clinically
evaluated concerning
erythema and grade of
drainage as well as pain
intensity (numeric
rating scale (NRS) 0-
10) and, additionally,
radiological assessment
was performed
concerning pin-
loosening/infection as
well as fracture healing
at T1 (Ø18 days), T2
(Ø44 days) and T3
(Ø65 days). In case of
pintrack complication,
1 5.
followed continuously.
The need for intensified
pin-site care, oral or
intravenous antibiotic
medication, re-
admission for
additional surgery and
premature fixator
removal was
documented. Bone
mineral density (BMD)
was determined by dual
energy X-ray
absorptiometry. At
fixator removal (T2),
strength was measured
by the use of an
electronic torque
wrench.
Results: Two pin-track
infections requiring
daily pin-site care and
oral antibiotics
occurred in the HA
group (2.6%) compared
with four in the steel
group (5.3%) (p =
0.601) and although a
trend towards a
superior performance
of HA pins was
detectable, the majority
of clinical pin-site-
parameters were
comparable in both
groups. At the end of
the fixator therapy, the
HA group showed a

		non-significant lower			
		rate of loose pins			
		(n(steel group) = 9;			
		n(HA group) = 6; p =			
		0.864) and both			
		hydroxyapatite-coated			
		pins showed at the			
		radius a significantly			
		stronger pin-bone			
		bonding measured by			
		the torque wrench			
		(p(proximal radius pin)			
		= 0.007; p(distal radius			
		pin) = 0.031). Except			
		for elderly patients of			
		the steel group $(p =$			
		0.018), all			
		demographic-, health-			
		and injury-related data			
		including BMD were			
		not correlated to any			
		type of pin-site			
		complication in both			
		groups (p > 0.05). Since			
		all fracture healed			
		uneventfully without			
		any type of additional			
		surgery, the number of			
		patients suffering			
		clinically relevant pin-			
		related complications			
		showed no significant			
		difference between			
		both groups (p =			
		0.707).			
		0.707).			
		6 1 : FI			
		Conclusions: The use			
		of HA-coated pins			
		compared with			
		standard stainless-steel			
		pins in external fixation			
		for unstable wrist			
		fractures yields only a			
		superior clinical			
		outcome.	D OF	THE	
0 /	Chlorhexidine-alcohol versus	Objectives: To	RCT	YES	NO
	povidone-iodine as preoperative skin	compare the efficacy of			
Gautam V.	antisepsis for prevention of surgical	chlorhexidine-alcohol			
	site infection in cesarean delivery-a	and povidone-iodine as			
	pilot randomized control trial. Trials.	preoperative antiseptic			
	2021 Aug 17;22(1):540. doi:	skin preparation for			
	= 1148 11,44(1).JTU. UUI.	prevention of surgical			
	10 1186/c13063 021 05400 4 DMID.		i I		
	10.1186/s13063-021-05490-4. PMID:				
	10.1186/s13063-021-05490-4. PMID: 34404473; PMCID: PMC8369632.	site infection (SSI) after			
		site infection (SSI) after cesarean delivery (CD).			
		site infection (SSI) after cesarean delivery (CD). Materials and methods:			
		site infection (SSI) after cesarean delivery (CD). Materials and methods: A total of 311 eligible			
		site infection (SSI) after cesarean delivery (CD). Materials and methods:			

CS were recented in the study after fulfilling all the eligibility and exclusion criteria. Patients were randomized into two groups (153 in chlorhessdine-alcohol group and 158 in porcione-iodine-group) by a computer-generated randomization table. Patients were followed for a period of 30 days in postoperative period to monitor for SSI. Results: The rate of SSI in the chlorheschne-alcohol group is 5.4% and that of the pooxdone-iodine group is 8.7% and that of the pooxdone-iodine group is 8.7% and that of the pooxdone-iodine group is 8.7% and Azineschocter baumantii were the most common organisms isolated. It coil was found in 2.5% of the total SSI cases. Conclusions: The study found that the praises who received chlorhesidine-alcohol as skin antispice had less chance of developing SSI han those who received pooxdone-iodine however, it did not each a statistical significance. 15. Kuhn KM, Boudrean JA, Watson JT. Rare combination of spalared actabular fracture-dislocation and pertrochartner fractures. And JOrthop (Belle Mead NJ). 2013 Aug42(8):372. 5. PMID: 24078956.						
the displatity and exclusion criteria. Patients were randomized into two groups (153 in chlorhexidin-alcohol group and 158 in porvidone-iodine group) by a computer-generated randomization table. Patients were followed for a period of 30 days in postoperative period to monitor for SSI. Results: The rare of SSI in the chlorhexidine-alcohol group is 54% and that of the povidone-iodine group is 86%. It. coli, K. pneumoniae, and Acinetobacter baumannii were the most common organisms soluted. E. coli was found in 9.2% of the total SSI cases. Conclusioner The study found that the patients were followed for a period of the coli SSI in the chlorhexidine-alcohol are six in an approach of the providence of the patients who can be considered to the patients who can be considered to the patients of the patients who can be considered to the patients of the pat						
exclusion criteria. Patients were randomized into two groups (15) in chlorhexidine alcohol group and 18 in powidone-isolaine group) by a computer-generated randomization table. Patients were followed for a period of 30 days in postoperative period to monitor for SSI. Results: The rate of SSI in the chlorhexidine-alcohol group is 8.6%. E. coli, K. pneumoniae, and that of the powidone-isolaine group is 8.6%. E. coli, K. pneumoniae, and Acinetobacter baumannii were the most common organisms isolated. E. coli was foamd in 9.5% of the total SSI cases. Conclusions: The study found that the patients who received pholiome-isolaine; however, it did not received chlorhexidine-alcohol as skin antiseptic had less chance of developing SSI than those who received powidone-isolaine; however, it did not reach a statistical significance. 15. Kuhn KM, Boudreau JA, Rare combination of ipsilateral acenbular fracture-dislocation and pertochanterie fracture, Am J Orthop (Belle Mead NJ). 2013 Augs42(8):372-5. PMID: 24078956.						
Patients were andomized into two groups (153 in chlorhexidine-alcohol group and 158 in providune-solutine group) by a computer-generated randomization table. Patients were followed for a period of 30 days in postpoerative period to monitor for SSI. Results: The rate of SSI in the chlorhexidine-alcohol group is 8.6% and that of the povidune-solutine group is 8.6% and that of the povidune-solutine group is 8.6%. It. cali, K. pneumoniac, and Acinetobarte baumannii were the most common organisms isolated. B. coli was found that the patients who for total SSI cases. Conclusions: The study found that the patients who received chlorhexidine-alcohol as skin antiseptic had less chance of developing SSI than those who received providune-solutie; however, it did not reach a statistical significance. 15. Kuhn KM, Boudreau JA, Watson JT. Rare combination of ipsilateral and perrochanteric fracture. And J Orthop (Belle Mead NJ). 2013 Augs42(8):372-5. PMIID: 24078956.						
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Wickman M, Cambon- Thomsen A, Haahtela T, Lambrecht BN, Lodrup Carlsen KC, Koppelman GH, Sunyer J, Zuberbier T, Allergy Clin Immunol. 2017 Feb;139(2):388-399. doi: environmental factors interlinked through IgE-associated and non-IgE-associated						
Thomsen A, Haahtela T, Lambrecht BN, Lodrup Carlsen KC, Koppelman GH, Sunyer J, Zuberbier T, Feb;139(2):388-399. doi: environmental factors interlinked through IgE-associated and non-IgE-associated						
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Carlsen KC, Koppelman 28183433. IgE-associated and non-IgE-associated			environmental factors			
GH, Sunyer J, Zuberbier T, non-IgE-associated	Thomsen A, Haahtela T, F					
GH, Sunyer J, Zuberbier T, non-IgE-associated	Thomsen A, Haahtela T, F Lambrecht BN, Lodrup 1	10.1016/j.jaci.2016.12.940. PMID:	interlinked through			
	Thomsen A, Haahtela T, F Lambrecht BN, Lodrup 1	10.1016/j.jaci.2016.12.940. PMID:	interlinked through			
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Mechanisms of the Development of ALLergy (MeDALL; EU FP7-CP-IP; project no: 261357; 2010-2015) studied the complex links of allergic diseases at the clinical and mechanistic levels by linking epidemiologic, clinical, mechanistic research, including in vivo and in vitro models. MeDALL integrated 14 European birth cohorts, including 44,010 participants and 160 cohort follow-ups between pregnancy and age 20 years. Thirteen thousand children were prospectively followed after puberty by using a newly standardized MeDALL Core Questionnaire. microarray developed for allergen molecules with increased IgE sensitivity was obtained for 3,292 children. Estimates of air pollution exposure from previous studies were available 10,000 children. Omics data included those from historical genome-wide studies association (23,000 children) and DNA methylation (2,173),targeted multiplex biomarker (1,427),and transcriptomic (723)studies. Using classical epidemiology machine-learning methods in 16,147 children aged 4 years and 11,080 children aged 8 years, MeDALL showed the multimorbidity of eczema, rhinitis, and asthma and estimated that only 38% of multimorbidity was

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		attributable to IgE			
		sensitization. MeDALL			
		has proposed a new			
		vision of			
		multimorbidity			
		independent of IgE			
		sensitization, and has			
		shown that			
		monosensitization and			
		polysensitization			
		represent 2 distinct			
		phenotypes. The			
		translational			
		component of			
		MeDALL is shown by			
		the identification of a			
		novel allergic			
		phenotype			
		characterized by			
		polysensitization and			
		multimorbidity, which			
		is associated with the			
		frequency, persistence,			
		and severity of allergic			
		symptoms. The results			
		of MeDALL will help			
		integrate personalized,			
		predictive,			
		preventative, and			
		participatory			
		approaches in allergic			
17. Bousquet I Schünemann HI	MACVIA clinical decision algorithm	approaches in allergic diseases.	Review	VES	NO
17. Bousquet J, Schünemann HJ,	MACVIA clinical decision algorithm	approaches in allergic diseases. The selection of	Review	YES	NO
Hellings PW, Arnavielhe S,	in adolescents and adults with allergic	approaches in allergic diseases. The selection of pharmacotherapy for	Review	YES	NO
Hellings PW, Arnavielhe S, Bachert C, Bedbrook A,	in adolescents and adults with allergic rhinitis. J Allergy Clin Immunol. 2016	approaches in allergic diseases. The selection of pharmacotherapy for patients with allergic	Review	YES	NO
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Hellings PW, Arnavielhe S, Bachert C, Bedbrook A, Bergmann KC, Bosnic- Anticevich S, Brozek J, Calderon M, Canonica GW, Casale TB, Chavannes NH,	in adolescents and adults with allergic rhinitis. J Allergy Clin Immunol. 2016 Aug;138(2):367-374.e2. doi: 10.1016/j.jaci.2016.03.025. Epub 2016	approaches in allergic diseases. The selection of pharmacotherapy for patients with allergic rhinitis (AR) depends on several factors, including age, prominent symptoms,	Review	YES	NO
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Hellings PW, Arnavielhe S, Bachert C, Bedbrook A, Bergmann KC, Bosnic- Anticevich S, Brozek J, Calderon M, Canonica GW, Casale TB, Chavannes NH, Cox L, Chrystyn H, Cruz AA, Dahl R, De Carlo G, Demoly	in adolescents and adults with allergic rhinitis. J Allergy Clin Immunol. 2016 Aug;138(2):367-374.e2. doi: 10.1016/j.jaci.2016.03.025. Epub 2016	approaches in allergic diseases. The selection of pharmacotherapy for patients with allergic rhinitis (AR) depends on several factors, including age, prominent symptoms, symptom severity, control of AR, patient	Review	YES	NO
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Hellings PW, Arnavielhe S, Bachert C, Bedbrook A, Bergmann KC, Bosnic- Anticevich S, Brozek J, Calderon M, Canonica GW, Casale TB, Chavannes NH, Cox L, Chrystyn H, Cruz AA, Dahl R, De Carlo G, Demoly P, Devillier P, Dray G, Fletcher M, Fokkens WJ, Fonseca J, Gonzalez-Diaz SN, Grouse L, Keil T, Kuna P, Larenas-Linnemann D, Lodrup Carlsen KC, Meltzer	in adolescents and adults with allergic rhinitis. J Allergy Clin Immunol. 2016 Aug;138(2):367-374.e2. doi: 10.1016/j.jaci.2016.03.025. Epub 2016	approaches in allergic diseases. The selection of pharmacotherapy for patients with allergic rhinitis (AR) depends on several factors, including age, prominent symptoms, symptom severity, control of AR, patient preferences, and cost. Allergen exposure and the resulting symptoms vary, and treatment adjustment is required. Clinical decision	Review	YES	NO
Hellings PW, Arnavielhe S, Bachert C, Bedbrook A, Bergmann KC, Bosnic-Anticevich S, Brozek J, Calderon M, Canonica GW, Casale TB, Chavannes NH, Cox L, Chrystyn H, Cruz AA, Dahl R, De Carlo G, Demoly P, Devillier P, Dray G, Fletcher M, Fokkens WJ, Fonseca J, Gonzalez-Diaz SN, Grouse L, Keil T, Kuna P, Larenas-Linnemann D, Lodrup Carlsen KC, Meltzer EO, Mullol J, Muraro A,	in adolescents and adults with allergic rhinitis. J Allergy Clin Immunol. 2016 Aug;138(2):367-374.e2. doi: 10.1016/j.jaci.2016.03.025. Epub 2016	approaches in allergic diseases. The selection of pharmacotherapy for patients with allergic rhinitis (AR) depends on several factors, including age, prominent symptoms, symptom severity, control of AR, patient preferences, and cost. Allergen exposure and the resulting symptoms vary, and treatment adjustment is required. Clinical decision support systems	Review	YES	NO
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Hellings PW, Arnavielhe S, Bachert C, Bedbrook A, Bergmann KC, Bosnic-Anticevich S, Brozek J, Calderon M, Canonica GW, Casale TB, Chavannes NH, Cox L, Chrystyn H, Cruz AA, Dahl R, De Carlo G, Demoly P, Devillier P, Dray G, Fletcher M, Fokkens WJ, Fonseca J, Gonzalez-Diaz SN, Grouse L, Keil T, Kuna P, Larenas-Linnemann D, Lodrup Carlsen KC, Meltzer EO, Mullol J, Muraro A, Naclerio RN, Palkonen S, Papadopoulos NG, Passalacqua G, Price D, Ryan D, Samolinski B, Scadding	in adolescents and adults with allergic rhinitis. J Allergy Clin Immunol. 2016 Aug;138(2):367-374.e2. doi: 10.1016/j.jaci.2016.03.025. Epub 2016	approaches in allergic diseases. The selection of pharmacotherapy for patients with allergic rhinitis (AR) depends on several factors, including age, prominent symptoms, symptom severity, control of AR, patient preferences, and cost. Allergen exposure and the resulting symptoms vary, and treatment adjustment is required. Clinical decision support systems (CDSSs) might be beneficial for the assessment of disease control. CDSSs should	Review	YES	NO
Hellings PW, Arnavielhe S, Bachert C, Bedbrook A, Bergmann KC, Bosnic- Anticevich S, Brozek J, Calderon M, Canonica GW, Casale TB, Chavannes NH, Cox L, Chrystyn H, Cruz AA, Dahl R, De Carlo G, Demoly P, Devillier P, Dray G, Fletcher M, Fokkens WJ, Fonseca J, Gonzalez-Diaz SN, Grouse L, Keil T, Kuna P, Larenas-Linnemann D, Lodrup Carlsen KC, Meltzer EO, Mullol J, Muraro A, Naclerio RN, Palkonen S, Papadopoulos NG, Passalacqua G, Price D, Ryan D, Samolinski B, Scadding GK, Sheikh A, Spertini F,	in adolescents and adults with allergic rhinitis. J Allergy Clin Immunol. 2016 Aug;138(2):367-374.e2. doi: 10.1016/j.jaci.2016.03.025. Epub 2016	approaches in allergic diseases. The selection of pharmacotherapy for patients with allergic rhinitis (AR) depends on several factors, including age, prominent symptoms, symptom severity, control of AR, patient preferences, and cost. Allergen exposure and the resulting symptoms vary, and treatment adjustment is required. Clinical decision support systems (CDSSs) might be beneficial for the assessment of disease control. CDSSs should be based on the best	Review	YES	NO
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(ARIA 2015 revision). It is one of the implementation systems of Action Plan B3 of the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA). Three tools are used for electronic monitoring of allergic diseases: a cell phonebased daily visual analogue scale (VAS) assessment of disease control, **CARAT** (Control of Allergic Rhinitis and Asthma Test) and e-Allergy screening (premedical system of early diagnosis of allergy and asthma based on online tools). These tools are combined with clinical decision support system (CDSS) and are available in many languages. An e-CRF and an e-learning tool complete MASK. MASK is flexible and other tools can be added. It appears to be an advanced, global and integrated ICT answer for many unmet needs allergic diseases which will improve policies and standards.

Panzner P, Papi A, Park HS,					
Pavord I, Pawankar R, Pfaar					
O, Picard R, Pigearias B, Pin					
I, Plavec D, Pohl W, Popov					
TA, Portejoie F, Postma D,					
Potter P, Price D, Rabe KF,					
Raciborski F, Radier Pontal					
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Cordeiro C, Rolland C,					
Rosado-Pinto J, Reitamo S,					
Rodenas F, Roman					
Rodriguez M, Romano A,					
Rosario N, Rosenwasser L,					
Rottem M, Sanchez-Borges					
M, Scadding GK, Serrano E,					
Schmid-Grendelmeier P,					
Sheikh A, Simons FE, Sisul					
JC, Skrindo I, Smit HA, Solé					
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Sunyer J, Thijs C, Todo-Bom					
A, Triggiani M, Valenta R,					
Valero AL, van Hage M,					
Vandenplas O, Vezzani G,					
Vichyanond P, Viegi G,					
Wagenmann M, Walker S,					
Wang DY, Wahn U, Williams					
DM, Wright J, Yawn BP,					
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Zar HJ, Zernotti ME, Zhang					
L, Zhong N, Zidarn M,					
Mercier J.					
19. Bousquet J, Anto JM,	Are allergic multimorbidities and IgE	Allergic diseases	Review	YES	NO
Wickman M, Keil T, Valenta	polysensitization associated with the	[asthma, rhinitis and			
R, Haahtela T, Lodrup	persistence or re-occurrence of foetal	atopic dermatitis (AD)]			
Carlsen K, van Hage M,	type 2 signalling? The MeDALL	are complex. They are			
Akdis C, Bachert C, Akdis M,	hypothesis. Allergy. 2015	associated with			
Auffray C, Annesi-Maesano	Sep;70(9):1062-78. doi:	allergen-specific IgE			
I, Bindslev-Jensen C,	10.1111/all.12637. Epub 2015 Jul 14.	and nonallergic			
Cambon-Thomsen A,	l	mechanisms that may			
Carlsen KH, Chatzi L,		coexist in the same			
Forastiere F, Garcia-		patient. In addition,			
Aymerich J, Gehrig U,		these diseases tend to			
Guerra S, Heinrich J,		cluster and patients			
Koppelman GH, Kowalski		present concomitant or			
ML, Lambrecht B, Lupinek		consecutive diseases			
C, Maier D, Melén E, Momas		(multimorbidity). IgE			
I, Palkonen S, Pinart M,		sensitization should be			
Postma D, Siroux V, Smit		considered as a			
HA, Sunyer J, Wright J,		quantitative trait.			
Zuberbier T, Arshad SH,					
		Important clinical and			
Nadif R, Thijs C, Andersson		immunological			
N, Asarnoj A, Ballardini N,		differences exist			
Ballereau S, Bedbrook A,		between mono- and			
Benet M, Bergstrom A,		polysensitized subjects.			
Brunekreef B, Burte E,		Multimorbidities of			
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Computer-assisted	
	Computer-assisted

planning of the
correction.
Correction.
Danta a sustina
Postoperative
management: Gradual
postoperative
correction of the
deformity by changing
the strut lengths
according to the
correction plan. Strut
changes, if required.
Osseous consolidation
of the osteotomy site
with the TSF or
revision to internal
fixation.
D 1 771
Results: The correction
of posttraumatic lower
leg deformities using
the TSF was performed
in 6 cases. The mean
deformity was 15° (12-
22°) in the frontal plane
and 6° (4-8°) in the
sagittal plane. The
correction time was 19
days (14-22 days). The
deviation between
planned and achieved
correction was 0-3° in
the frontal plane and 0-
2° in the sagittal plane.
The osseous
consolidation of the
osteotomy site was
carried out in the TSF
in 5 cases with a mean
external fixation time of
112 days (94-134 days).
In one case, the TSF
was removed after the
correction and the
osteotomy site was
fixed using an
intramedullary nail. Pin
site infections were
observed in 3 cases.
There were no further
complications. The
treatment goal was
achieved in all cases.
The examination at
final follow-up was
performed after 1 year.
All patients were able to
walk without walking
aids and with no pain at

that time. They were able to perform all of their activities of the daily life and their leisure activities without limitations. 21. Carella M, Tran G, Bonhomme VI., Fransser G. Regional Scalp Block on Ilemedynamic Stablity, Intra- and Postoperative Opioid Consumption in Supratentorial Caraiotomies: A Randomized Controlled ITal. Anesth Aralg. 2021 Feb i 132(2):500-511. doi: 10.1213/ANIE.0000000000005230. PMID: 33060491. PMID: 33060491. PMID: 33060491. Was a season of the daily life and their leisure activities of supratentorial cranitorial control. This properative pain We aimed at evaluating the influence of regional scalp block (SB) on hemodynamic stablity during the noxious events of appratentional cranitorial						
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adjusted according to						
hemodynamic						
parameters and state						
entropy of the						
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			(SE), respectively.			

Mean arterial blood
pressure (MAP), heart
rate (HR), SE, and
propofol and
remifentanil effect-site
concentrations (Ce)
were recorded at the
time of scalp block
performance (Baseline),
and 0, 1, 3, and 5
minutes after skull-pin
fixation (SP), skin
incision (SI), CR, and
dura-mater incision
(DM). Morphine
consumption and
postoperative pain
intensity (0-10 visual
analog scale [VAS])
were recorded 1, 3, 6,
24, and 48 hours after
surgery. Propofol and
remifentanil overall
infusion rates were also
recorded. Data were
analyzed using 2-tailed
Student unpaired t
tests, 2-way mixed-
design analysis of
variance (ANOVA),
and Tukey's honestly
significant difference
(HSD) tests for post
hoc comparisons as
appropriate.
Results: Demographics
and length of anesthetic
procedure of group CO
and SB were
comparable. SP, SI, and
CR were associated
with a significantly
higher MAP in group
CO than in group SB, at
least at one of the time
points of recording
surrounding those
noxious events. This
was not the case at DM.
Similarly, HR was
significantly higher in
group CO than in
group SB during SP and
SI, at least at 1 of the
points of recording, but
not during CR and DM.
Propofol and
remifentanil Ce and
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		overall infusion rates			
		were significantly			
		higher in group CO			
		than in group SB,			
		except for propofol Ce			
		during SP.			
		Postoperative pain			
		VAS and cumulative			
		morphine consumption			
		were significantly			
		higher in group CO			
		than in group SB.			
		Conclusions: In			
		supratentorial			
		craniotomies, SB			
		improves			
		hemodynamic control			
		during noxious events			
		and provides adequate			
		and prolonged			
		postoperative pain			
		control as compared to			
		placebo.			
22. Bousquet J, Anto JM, Akdis	Paving the way of systems biology and	MeDALL (Mechanisms	Review	YES	NO
M, Auffray C, Keil T, Momas	precision medicine in allergic diseases:	of the Development of	110 / 10 //	120	
I, Postma DS, Valenta R,		ALLergy; EU FP7-CP-			
Wickman M, Cambon-	Mechanisms of the Development of	IP; Project No: 261357;			
Thomsen A, Haahtela T,		2010-2015) has			
Lambrecht BN, Lodrup	261357; 2010-2015. Allergy. 2016	proposed an innovative			
Carlsen KC, Koppelman	Nov;71(11):1513-1525. doi:	approach to develop			
GH, Sunyer J, Zuberbier T,	10.1111/all.12880. Epub 2016 Aug 23.	early indicators for the			
Annesi-Maesano I, Arno A,	PMID: 26970340; PMCID: PMC5248602.	prediction, diagnosis,			
Bindslev-Jensen C, De Carlo	PMC3246002.	prevention and targets			
G, Forastiere F, Heinrich J,		for therapy. MeDALL			
Kowalski ML, Maier D,		has linked			
Melén E, Palkonen S, Smit		epidemiological, clinical			
HA, Standl M, Wright J,		and basic research using			
Asarnoj A, Benet M,		a stepwise, large-scale			
Ballardini N, Garcia-		and integrative			
Aymerich J, Gehring U,		approach: MeDALL			
Guerra S, Hohman C, Kull I,		data of precisely			
Lupinek C, Pinart M, Skrindo		phenotyped children			
I, Westman M, Smagghe D,		followed in 14 birth			
Akdis C, Albang R,		cohorts spread across			
Anastasova V, Anderson N,		Europe were combined			
Bachert C, Ballereau S,		with systems biology			
Ballester F, Basagana X,		(omics, IgE			
Bedbrook A, Bergstrom A,		measurement using			
von Berg A, Brunekreef B,		microarrays) and			
Burte E, Carlsen KH, Chatzi		environmental data.			
L, Coquet JM, Curin M,		Multimorbidity in the			
Demoly P, Eller E, Fantini		same child is more			
MP, Gerhard B, Hammad H,		common than expected			
von Hertzen L, Hovland V,		by chance alone,			
Jacquemin B, Just J, Keller T,	1				
		i suggesting that these			
		suggesting that these diseases share causal			
Kerkhof M, Kiss R,		diseases share causal			

Lemonnier N, McEachan R,				
	sensitization. IgE			
	sensitization should be			
	considered differently			
	in monosensitized and			
	polysensitized			
Rial-Sebbag A, Saeys Y,	individuals. Allergic			
	multimorbidities and			
	IgE polysensitization			
J' 0 '	are often associated			
	with the persistence or			
	severity of allergic			
	diseases.			
	Environmental			
	exposures are relevant			
	for the development of			
	allergy-related diseases.			
	To complement the			
	population-based			
	studies in children,			
	MeDALL included			
	mechanistic mediaded			
	experimental animal			
	studies and in vitro			
	studies in humans. The			
l i	integration of			
	multimorbidities and			
	polysensitization has			
	resulted in a new			
	classification			
f	framework of allergic			
	diseases that could help			
	to improve the			
	understanding of			
	genetic and epigenetic			
	mechanisms of allergy			
	as well as to better			
l r	manage allergic			
	diseases. Ethics and			
	•			
	considered. MeDALL			
	has deployed			
t	translational activities			
	within the EU agenda.			
	Purpose: The purpose	RCT	YES	NO
	of this study was to			
	evaluate the outcome of			
	Ilizarov external			
	fixation (IE) versus			
Epub 2014 Dec 5. PMID: 25472753.	dynamic compression			
	plate (PO) in the			
	management of extra-			
	articular distal tibial			
f	fractures.			
	Methods: Between			
	2010 and 2011, extra-			
	articular distal tibial			
	fractures in 40			
	consecutive patients			

met the inclusion
criteria. They were
classified according to
AO classification
fracture type A (A1, A2,
randomized method,
two equal groups were
managed using either
IE or PO. PO was
performed using open
reduction and internal
fixation (ORIF) and
DCP through
anterolateral approach.
IE was done using
Ilizarov frame. For the
PO group, non-weight
bearing ambulation was
permitted on the
second postoperative
day but partial weight
bearing was permitted
according to the
progression in union
criteria clinically and
radiologically. For the
IE group, weight
bearing started as
tolerated from the first
postoperative day.
Physiotherapy and pin-
site care was performed
by the patient
themselves.
diemoerveo.
Results: Modified
Mazur ankle score was
applied to IE (excellent
10, good 10) and in PO
(excellent 2, good 8,
poor 6). Data were
statically analysed using
(Mann-Whitney test).
The rate of healing in
the IE group (average
130) was higher than
the PO (average 196.5);
plus, there were no
cases of delayed union
or nonunion in the IE
group (p value 0.003).
2
Conclusion: It was
found that IE
compared with PO
provides provision of
immediate weight
bearing as tolerated

		following postoperative			
		recovery, irrespective			
		of radiological or			
		clinical healing with no			
		infection, deformity or			
		non-union.			
24. Rukwied R, Mayer A,	NGF induces non-inflammatory	Nerve growth factor	Clinical	YES	NO
24. Rukwied R, Mayer A, Kluschina O, Obreja O,	localized and lasting mechanical and	(NGF) modulates	trial	1123	NO
Schley M, Schmelz M.	thermal hypersensitivity in human		uiai		
Schley M, Schineiz M.					
	skin. Pain. 2010 Mar;148(3):407-413.	sprouting of			
	doi: 10.1016/j.pain.2009.11.022. Epub	nociceptors. We			
	2009 Dec 22. PMID: 20022698.	explored the spatial and			
		temporal sensitization			
		induced by NGF			
		injection (1 microg) in			
		human skin.			
		Hyperalgesia was			
		investigated in 16			
		volunteers (36+/-9			
		years) at day 1, 3, 7, 21,			1
		and 49. Areas of			1
		mechanical (brush, pin-			
		prick) and heat (43			
		degrees C) sensitization			
		were mapped and			
		thermal (heat and cold)			
		pain thresholds,			
		mechanical (impact			
		stimulation) and			
		electrically evoked pain,			
		and axon reflex flare			
		were assessed. No			
		spontaneous pain or			
		local inflammation was			
		recorded upon NGF			
		injection and during 49			
		days. Sensitization to heat was maximum at			
		day 3 and lasted 21			
		days. Hyperalgesia to			
		cold was recorded at			1
		day 7 and 21.			
		Hypersensitivity to			1
		mechanical impact			1
		stimuli developed			
		delayed, reached			1
		maximum at day 21,			1
		and persisted			
		throughout 49 days.			1
		Fifty percent of all			
		volunteers reported a			1
		static allodynia to tonic			1
		pressure until day 21.			
		Electrical stimulation at			1
		7.5 mA was more			
		painful at the NGF site			1
		at day 21, which			
		correlated significantly			1
		to maximum impact			1
,	ı	1	1		

		pain. Axon reflex flare			
		was unaffected by			
		NGF. Sensitization was			
		limited to the NGF			
		injection site, no touch-			
		or pin-prick evoked			
		secondary hyperalgesia			
		was observed. Spatially			
		restricted hyperalgesia			
		indicates a peripheral			
		rather than central			
		mechanism. The			
		temporal profile of			
		lasting nociceptor			
		sensitization suggests			
		an altered peripheral			
		axonal expression of			
		sensory proteins			
		specifically leading to			
		mechanical and thermal			
		sensitization.			
		Intradermal NGF			
		administration			
		provokes a pattern of			
		sensitization that can be			
		used as experimental			
		model for neuropathic			
		pain.			
25. Garg RK, Paliwal VK.	Spectrum of neurological	COVID-19 vaccines	Review	YES	NO
3 - ,	complications following COVID-19	have brought us a ray of	/	_	_
	vaccination. Neurol Sci. 2022	hope to effectively fight			
	Jan;43(1):3-40. doi: 10.1007/s10072-	against deadly			
	021-05662-9. Epub 2021 Oct 31.	pandemic of COVID-			
	PMID: 34719776; PMCID:	19 and hope to save			
	PMC8557950.	lives. Many vaccines			
		have been granted			
		S			
		emergency use			
		emergency use authorizations by many			
		emergency use			
		emergency use authorizations by many			
		emergency use authorizations by many countries. Post-			
		emergency use authorizations by many countries. Post- authorization, a wide spectrum of			
		emergency use authorizations by many countries. Postauthorization, a wide spectrum of neurological			
		emergency use authorizations by many countries. Post-authorization, a wide spectrum of neurological complications is			
		emergency use authorizations by many countries. Post-authorization, a wide spectrum of neurological complications is continuously being			
		emergency use authorizations by many countries. Post-authorization, a wide spectrum of neurological complications is continuously being reported following			
		emergency use authorizations by many countries. Post-authorization, a wide spectrum of neurological complications continuously being reported following COVID-19			
		emergency use authorizations by many countries. Post-authorization, a wide spectrum of neurological complications is continuously being reported following COVID-19 vaccination.			
		emergency use authorizations by many countries. Postauthorization, a wide spectrum of neurological complications is continuously being reported following COVID-19 vaccination. Neurological adverse			
		emergency use authorizations by many countries. Postauthorization, a wide spectrum of neurological complications is continuously being reported following COVID-19 vaccination. Neurological adverse events following			
		emergency use authorizations by many countries. Postauthorization, a wide spectrum of neurological complications is continuously being reported following COVID-19 vaccination. Neurological adverse events following vaccination are			
		emergency use authorizations by many countries. Postauthorization, a wide spectrum of neurological complications is continuously being reported following COVID-19 vaccination. Neurological adverse events following vaccination are generally mild and			
		emergency use authorizations by many countries. Postauthorization, a wide spectrum of neurological complications is continuously being reported following COVID-19 vaccination. Neurological adverse events following vaccination are generally mild and transient, like fever and			
		emergency use authorizations by many countries. Postauthorization, a wide spectrum of neurological complications is continuously being reported following COVID-19 vaccination. Neurological adverse events following vaccination are generally mild and transient, like fever and chills, headache,			
		emergency use authorizations by many countries. Postauthorization, a wide spectrum of neurological complications is continuously being reported following COVID-19 vaccination. Neurological adverse events following vaccination are generally mild and transient, like fever and			
		emergency use authorizations by many countries. Postauthorization, a wide spectrum of neurological complications is continuously being reported following COVID-19 vaccination. Neurological adverse events following vaccination are generally mild and transient, like fever and chills, headache, fatigue, myalgia and			
		emergency use authorizations by many countries. Postauthorization, a wide spectrum of neurological complications is continuously being reported following COVID-19 vaccination. Neurological adverse events following vaccination are generally mild and transient, like fever and chills, headache, fatigue, myalgia and arthralgia, or local			
		emergency use authorizations by many countries. Postauthorization, a wide spectrum of neurological complications is continuously being reported following COVID-19 vaccination. Neurological adverse events following vaccination are generally mild and transient, like fever and chills, headache, fatigue, myalgia and arthralgia, or local injection site effects like			
		emergency use authorizations by many countries. Postauthorization, a wide spectrum of neurological complications is continuously being reported following COVID-19 vaccination. Neurological adverse events following vaccination are generally mild and transient, like fever and chills, headache, fatigue, myalgia and arthralgia, or local injection site effects like swelling, redness, or			
		emergency use authorizations by many countries. Postauthorization, a wide spectrum of neurological complications is continuously being reported following COVID-19 vaccination. Neurological adverse events following vaccination are generally mild and transient, like fever and chills, headache, fatigue, myalgia and arthralgia, or local injection site effects like			

	neurological post-			
	vaccination			
	complication is cerebral			
	venous sinus			
	thrombosis. Cerebral			
	venous sinus is			
	frequently reported in			
	females of childbearing			
	age, generally following			
	adenovector-based			
	vaccination. Another			
	major neurological			
	complication of			
	concern is Bell's palsy			
	that was reported			
	dominantly following			
	mRNA vaccine			
	administration. Acute			
	transverse myelitis,			
	acute disseminated			
	encephalomyelitis, and			
	acute demyelinating			
	polyneuropathy are			
	other unexpected			
	neurological adverse			
	events that occur as			
	result of phenomenon			
	of molecular mimicry.			
	Reactivation of herpes			
	zoster in many persons,			
	following			
	administration of			
	mRNA vaccines, has			
	been also recorded.			
	Considering the			
	enormity of recent			
	COVID-19-vaccinated			
	population, the number			
	of serious neurological			
	events is miniscule.			
	Large collaborative			
	prospective studies are			
	needed to prove or			
	disprove causal			
	association between			
	vaccine and			
	neurological adverse			
	events occurring			
	vaccination.			
26. Georgiades DS. A Systematic Integrative Review of Pin				
Site Crusts. Orthop Nurs. 2018				
Jan/Feb;37(1):36-42. doi:				
10.1097/NOR.000000000000116.				
PMID: 29369133.				
27. Guerado E, Cano JR, Pin tract infection prophylaxis and	Pin tract infection in	Review	YES	YES
Fernandez-Sanchez F. treatment. Injury. 2019 Jun;50 Suppl	external fixation			-
		I	1	
1:S45-S49. doi:	(ExFix) is a frequent			
	(ExFix) is a frequent			
1:S45-S49. doi: 10.1016/j.injury.2019.03.044. Epub 2019 Apr 1. PMID: 31003703.	(ExFix) is a frequent finding which can eventually lead to			

		loosening,			
		osteomyelitis and loss			
		of fixation. Its diagnosis			
		is based on high			
		empiricism and low			
		validity, although it is			
		possible to distinguish			
		between minor and			
		major infection. The			
		first is limited to soft			
		tissues, whereas the			
		latter includes bone			
		involvement. The rate			
		of infection after			
		conversion of external			
		fixation to			
		intramedullary nailing			
		(IMN) is not well			
		known. Unfortunately,			
		papers referring to			
		infection after the			
		conversion of ExFix to			
		intramedullary nailing			
		(IMN) are of evidence			
		level IV or V. It is			
		suggested that			
		conversion of ExFix to			
		IMN should be carried			
		out in a 2 step regimen.			
		The time interval of 2			
		step regimen is			
		uncertain although			
		uncertain although			
		uncertain although some authors have			
		uncertain although some authors have recommended to occur			
		uncertain although some authors have			
		uncertain although some authors have recommended to occur within 9 days. There is			
		uncertain although some authors have recommended to occur within 9 days. There is no consensus as to			
		uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis			
		uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be			
		uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to			
		uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be			
		uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to			
		uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into			
		uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue,			
		uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registrics capturing			
		uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registries capturing important related			
		uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registrics capturing important related parameters to the			
		uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registries capturing important related			
		uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registries capturing important related parameters to the development of			
		uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registries capturing important related parameters to the development of infection should be			
20 Visitakia I. Guzuda E	Din site ages ages we have the	uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registries capturing important related parameters to the development of infection should be established.	Davissa	VEC	
28. Ktistakis I, Guerado E,	Pin-site care: can we reduce the	uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registries capturing important related parameters to the development of infection should be established. Background: This study	Review	YES	YES
28. Ktistakis I, Guerado E, Giannoudis PV.	incidence of infections? Injury. 2015	uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registries capturing important related parameters to the development of infection should be established. Background: This study was conducted to	Review	YES	YES
	incidence of infections? Injury. 2015 Sep;46 Suppl 3:S35-9. doi:	uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registries capturing important related parameters to the development of infection should be established. Background: This study	Review	YES	YES
	incidence of infections? Injury. 2015	uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registries capturing important related parameters to the development of infection should be established. Background: This study was conducted to determine the pin site	Review	YES	YES
	incidence of infections? Injury. 2015 Sep;46 Suppl 3:S35-9. doi: 10.1016/S0020-1383(15)30009-7.	uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registries capturing important related parameters to the development of infection should be established. Background: This study was conducted to determine the pin site care protocols currently	Review	YES	YES
	incidence of infections? Injury. 2015 Sep;46 Suppl 3:S35-9. doi:	uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registries capturing important related parameters to the development of infection should be established. Background: This study was conducted to determine the pin site care protocols currently in use and to analyse	Review	YES	YES
	incidence of infections? Injury. 2015 Sep;46 Suppl 3:S35-9. doi: 10.1016/S0020-1383(15)30009-7.	uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registries capturing important related parameters to the development of infection should be established. Background: This study was conducted to determine the pin site care protocols currently in use and to analyse their effectiveness and	Review	YES	YES
	incidence of infections? Injury. 2015 Sep;46 Suppl 3:S35-9. doi: 10.1016/S0020-1383(15)30009-7.	uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registries capturing important related parameters to the development of infection should be established. Background: This study was conducted to determine the pin site care protocols currently in use and to analyse	Review	YES	YES
	incidence of infections? Injury. 2015 Sep;46 Suppl 3:S35-9. doi: 10.1016/S0020-1383(15)30009-7.	uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registries capturing important related parameters to the development of infection should be established. Background: This study was conducted to determine the pin site care protocols currently in use and to analyse their effectiveness and outcomes.	Review	YES	¥ES
	incidence of infections? Injury. 2015 Sep;46 Suppl 3:S35-9. doi: 10.1016/S0020-1383(15)30009-7.	uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registries capturing important related parameters to the development of infection should be established. Background: This study was conducted to determine the pin site care protocols currently in use and to analyse their effectiveness and	Review	YES	¥ES
	incidence of infections? Injury. 2015 Sep;46 Suppl 3:S35-9. doi: 10.1016/S0020-1383(15)30009-7.	uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registries capturing important related parameters to the development of infection should be established. Background: This study was conducted to determine the pin site care protocols currently in use and to analyse their effectiveness and outcomes: Methods: PubMed, the	Review	YES	¥ES
	incidence of infections? Injury. 2015 Sep;46 Suppl 3:S35-9. doi: 10.1016/S0020-1383(15)30009-7.	uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registries capturing important related parameters to the development of infection should be established. Background: This study was conducted to determine the pin site care protocols currently in use and to analyse their effectiveness and outcomes. Methods: PubMed, the Cochrane Library and	Review	YES	YES
	incidence of infections? Injury. 2015 Sep;46 Suppl 3:S35-9. doi: 10.1016/S0020-1383(15)30009-7.	uncertain although some authors have recommended to occur within 9 days. There is no consensus as to which prophylaxis protocol should be applied prior to conversion. In order to throw more light into this important issue, registries capturing important related parameters to the development of infection should be established. Background: This study was conducted to determine the pin site care protocols currently in use and to analyse their effectiveness and outcomes: Methods: PubMed, the	Review	YES	¥ES

f	sereened for manuscripts that	
	manuscripts that	
	lescribed comparative	
	studies of different	
	methods of pin-site	
	care and referred to	
	complications related	
	to any kind of external	
	Exator application.	
	Results: A total of 369	
	manuscripts were	
l s	screened and only 13 of	
l t	these met the inclusion	
	eriteria evaluating	
	lifferent protocols of	
	oin-site care. This	
	review is based on a	
	total of 574 patients.	
	Infection rates were	
₹	very variable depending	
	on the type of implant	
l t	used and the protocol	
	of pin-site care applied.	
	or pin one care applica.	
	Conclusions: None of	
	the different protocols	
	of pin-site care that	
	were evaluated in this	
S	study were associated	
 	with a 0% infection	
	rate. There is currently	
	no consensus in the	
	nternational literature	
	about which protocol	
	should be applied	
	universally. Meticulous	
S	surgical technique	
\mid	during pin insertion and	
	mplementation of one	
	of the existing	
	protocols of pin-site	
1	care are the mainstay of	
	,	
1	orevention and/or	
	reduction of the	
	ncidence of pin-site	
	nfections.	
29. Jennison T, McNally M, Prevention of infection in external I	Infection in external Review YES	YES √
	fixator pins is known to	
*	pe a significant	
	problem, with	
, ,	ncidences between 3%	
1		
	and 80% reported in	
	the literature. An	
	nfection occurs when	
	olanktonic bacteria	
	adhere to external	
	fixator pins and	
	subsequently produce a	
1	subsequently produce a	

biofilm which protects
the bacteria from host
defences. The most
commonly implicated
organisms are
Staphylococcus aureus
and Staphylococcus
epidermidis. Once an infection occurs,
treatment is difficult.
Systemic antibiotics
have limited benefits
and considerable side-
effects. The only
definitive management
is removal of the pin.
This review will
consider the current
and potential future
strategies for reducing
pin site infection.
Techniques to prevent
infection must prevent
bacterial adhesion,
allow good
osteointegration and
have a low toxicity.
Current areas of
interest reviewed are
titanium-copper alloys,
nanosilver coatings,
nitric oxide coatings,
chitosan coatings,
chlorhexidine and
iodine, hydroxyapatite
and antibiotic coatings.
At present there is no
consensus on the
prevention of pin site
infection, and there is a
paucity of randomized
controlled trials on
which to draw a
conclusion. Whilst a
number of these
strategies have potential
future use, many of the
above strategies need
further studies in
animal models to
ensure no cytotoxicity
and prevention of
osteointegration.
Following this, well-
designed randomized
controlled clinical trials
are required to give
future ways to prevent

	1			1	<u> </u>
		external fixator pin site infections.			
30. Lethaby A, Temple J, Santy-	Pin site care for preventing infections	intections.			
Tomlinson J.	associated with external bone fixators and pins. Cochrane Database Syst Rev. 2013 Dec 3;(12):CD004551. doi: 10.1002/14651858.CD004551.pub3. PMID: 24302374.				
31. Yuenyongviwat V, Tangtrakulwanich B.		Objective: Pin-site infection is one of the most troublesome complications of external fixation. The present study aimed to compare the rate of pin-site infection following silver sulfadiazine with dry dressing. Material and method: This was a prospective randomized controlled study among 30 clients that compared the outcome of pin dressing using silver sulfadiazine (study group = 15) with dry dressing (control = 15). All eligible subjects of open tibial fracture had an emergency debridement with external fixation. Pin tract infection was considered to be present if superficial inflammation (erythema, cellulitis), serous or purulent discharge occurred around a pin site and deep infection of osteolysis around the pin, and sequestrum. Results: Seven subjects (46.7%) had pin-site infection in the present study group while six subjects (40.0%) had it in the control group, with comparable severity. Conclusion: There was no significant difference in prevalence	RCT	YES	YES

		of pin-site infection			
		between both groups (p			
		= 0.97). Therefore,			
		either silver sulfadiazine			
		or dry dressing could be			
		advocated.	p. ott		
32. Lu D, Wang T, Chen H, Sun	Management of pin tract infection in	The objective of this	RCT	YES	YES
LJ.	pediatric supracondylar humerus	study was to			
	fractures: a comparative study of three	prospectively compare			
	methods. Eur J Pediatr. 2017	the incidence of pin			
	May;176(5):615-620. doi:	tract infection in			
	10.1007/s00431-017-2884-1. Epub	pediatric supracondylar			
	2017 Mar 1. PMID: 28251295.	humerus fractures			
		managed with pin care			
		daily or every other day			
		or weekly. We			
		hypothesized that there			
		were some differences			
		between these three			
		methods. From June			
		2012 to May 2015, 135			
		children with			
		supracondylar humerus			
		fractures were			
		randomized to			
		postoperative pin care			
		by cleaning pin tracts			
		daily (group A, 45			
		cases) or cleaning every			
		2 days (group B, 45			
		cases) or cleaning			
		weekly (group C, 45			
		cases). The three			
		groups were			
		comparable with			
		respect to age, gender,			
		affected side, body			
		mass index (BMI),			
		fracture type, injury to			
		surgery time, number			
		of intraoperative			
		percutaneous pinning,			
		and follow-up time. We			
		collected data on pin			
		retention time, union			
		time, and pin tract			
		infection. The average			
		follow-up time of			
		group Λ was 4.5 ± 1.3			
		and 4.2 ± 1.6 months in			
		group B and 4.3 ± 1.4			
		months in group C. The			
		patient demographics			
		and intraoperative			
		variables of three			
		groups were			
		comparable. No			
		significant difference			
		between these three		<u> </u>	<u> </u>

	groups was found in
	union time and pin
	fixation time. Of the
	135 children, 48
	(35.6%) cases had pin
	tract infection. Grade I
	infections (Checketts-
	Otterburns
	classification) occurred
	around 28.9% of 270
	pin and grade II around
	6.7%. We found no
	differences between
	three groups as regards
	frequency and severity
	of pin tract infections
	(both P > 0.05).
	However, complain of
	pain was more frequent
	in group A than other
	two groups (P < 0.05).
	two groups (1 10.05).
	Conclusions: All of the
	three methods were
	effective for the
	management of pin site
	infection in pediatric
	supracondylar humerus
	fractures. However,
	excessive frequent care
	as well as pin care daily
	had the disadvantages
	of child's fear and
	parental anxiety. What
	is Known: • Pin site
	infection is a common
	complication after
	fracture fixation and
	bone lengthening using
	percutaneous pins or
	wires. • Closed
	reduction and
	pereutaneous K-wires
	fixation are the
	mainstay of treatment
	in pediatric
	supracondylar humeral
	fractures. What is New:
	• All of the three
	methods were effective
	for the management of
	pin site infection.
	Excessive frequent care
	as well as pin care daily
	has the disadvantages
	of child's fear and
	parental anxiety.
33. Lee CK, Chua YP, Saw A. Antimicrobial gauze as a dressing	
	Background: Pin site RCT YES YES
reduces pin site infection: a	Background: Pin site RCT YES YES Infection is a common

randomized controlled trial. Clin problem in external Orthop Relat Res. 2012 fixation. Plain gauze Feb;470(2):610-5. doi: wetted with normal saline is commonly 10.1007/s11999-011-1990-z. Epub 2011 Aug 13. PMID: 21842299; used for a pin site PMCID: PMC3254747. dressing owing to the simplicity and low cost. Evidence to support adding an antimicrobial agent in the dressing material is lacking. Questions/purposes: We compared the rate of pin tract infection using plain gauze and gauze impregnated with polyhexamethylene biguanide in patients undergoing limb lengthening procedures. Patients and methods: We included 38 patients (40 limbs) undergoing limb lengthening or deformity correction using an external fixator between July 2009 and June 2010. There were 23 male patients and 15 female patients, with a mean age of 26.3 years (range, 5-68 years). The patients were randomized into two groups: polyhexamethylene biguanide group (22 limbs) and a control group (18 limbs). The metal-skin interfaces were assessed by a researcher blinded to the type of gauze at 2, 4, 8, and 12 weeks after surgery for the pin site infection based on a predetermined grading system. There were a total of 483 metal-skin interfaces, with 1932 total observations. Infection rates were compared using the chi

square test and relative

95%

with

confidence interval.

risk

	I		Г	ı	
34. Subramanyam KN, Mundargi AV, Potarlanka R, Khanchandani P.	No role for antiseptics in routine pin site care in Hizarov fixators: A randomised prospective single blinded control study. Injury. 2019 Mar;50(3):770-776. doi: 10.1016/j.injury.2019.01.031. Epub 2019 Jan 23. PMID: 30711321.	Results: The infection rate was lower (χ(2) [1, n = 1932] = 23.00) and the risk for infection was lower (relative risk, 0.228; 95% confidence interval, 0.118, 0.443) for the polyhexamethylene biguanide group (n = 1068; 1.0%) than for the control group (n = 864; 4.5%). Conclusions: Use of polyhexamethylene biguanide-impregnated gauze can reduce the risk of pin tract infection in external fixation. Level of evidence: Level I, therapeutic study. See Guidelines for Authors for a complete description of levels of evidence. Introduction: Pin site infection is the commonest complication of lizarov external fixation. The aim of the study was to examine if use of antisepties was superior over control and further if daily dressing was superior to weekly dressing in regular pin site care in reducing the burden of pin site infection in Ilizarov fixators. Patients and methods: A total of 114 patients (2363 pin sites) were randomised to receive regular pin site care alone (30 patients, 638 pin sites) or with additional application of povidone iodine (27 patients, 561 pin sites);	RCT	YES	∆ ₩
		of povidone iodine (27 patients, 561 pin sites), silver sulfadiazine (27 patients, 570 pin sites)			

patients, 594 pin sites).
The pin tracts were
sub-randomised to
receive daily (1212 pin
sites) or weekly (1151
pin sites) dressings. The
primary outcome was
pin site infection days
rate across all four
groups. The secondary
outcomes were - mean
duration to first episode
of infection, differences
between daily and
weekly dressing groups,
mean duration of
antibiotic therapy and
incidence of re-
interventions and
sequelae. We also
recorded frequency of
bacterial pathogens in
all microbiological
samples submitted.
Block randomization
using computer-
generated random
numbers was used. The
assessor of outcome
was blinded.
was binided.
Results: All patients
completed the study.
Pin site infection rate
days per 1000 pin site days observed was
marginally less in
marginally less in chlorhexidine group,
marginally less in chlorhexidine group, but was not statistically
marginally less in chlorhexidine group, but was not statistically significant compared to
marginally less in chlorhexidine group, but was not statistically significant compared to other antiseptics and
marginally less in chlorhexidine group, but was not statistically significant compared to other antiseptics and control group
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marginally less in chlorhexidine group; but was not statistically significant compared to other antiseptics and control group (Absolute value in control, povidone iodine, silver
marginally less in chlorhexidine group, but was not statistically significant compared to other antiseptics and control group (Absolute value in control, povidone iodine, silver sulphadiazine and
marginally less in chlorhexidine group; but was not statistically significant compared to other antiseptics and control group (Absolute value in control, povidone iodine, silver
marginally less in chlorhexidine group, but was not statistically significant compared to other antiseptics and control group (Absolute value in control, povidone iodine, silver sulphadiazine and
marginally less in chlorhexidine group; but was not statistically significant compared to other antiseptics and control group (Absolute value in control, povidone iodine, silver sulphadiazine and chlorhexidine groups
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marginally less in chlorhexidine group, but was not statistically significant compared to other antiseptics and control group (Absolute value in control, povidone iodine, silver sulphadiazine and chlorhexidine groups were respectively 2.04 ± 4.27, 2.04 ± 3.65, 1.85 ± 3.37, 1.37 ±
marginally less in chlorhexidine group, but was not statistically significant compared to other antiseptics and control group (Absolute value in control, povidone iodine, silver sulphadiazine and chlorhexidine groups were respectively 2.04 ± 4.27, 2.04 ± 3.65, 1.85 ± 3.37, 1.37 ± 2.35, p value 0.92).
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marginally less in chlorhexidine group; but was not statistically significant compared to other antiseptics and control group (Absolute value in control, povidone iodine, silver sulphadiazine and chlorhexidine groups were respectively 2.04 ± 4.27, 2.04 ± 3.65, 1.85 ± 3.37, 1.37 ± 2.35, p value 0.92). Daily dressing category showed slightly less pin
marginally less in chlorhexidine group; but was not statistically significant compared to other antiseptics and control group (Absolute value in control, povidone iodine, silver sulphadiazine and chlorhexidine groups were respectively 2.04 ± 4.27, 2.04 ± 3.65, 1.85 ± 3.37, 1.37 ± 2.35, p value 0.92). Daily dressing category showed slightly less pin site infection days rate
marginally less in chlorhexidine group; but was not statistically significant compared to other antiseptics and control group (Absolute value in control, povidone iodine, silver sulphadiazine and chlorhexidine groups were respectively 2.04 ± 4.27, 2.04 ± 3.65, 1.85 ± 3.37, 1.37 ± 2.35, p value 0.92). Daily dressing category showed slightly less pin site infection days rate within each group and
marginally less in chlorhexidine group; but was not statistically significant compared to other antiseptics and control group (Absolute value in control, povidone iodine, silver sulphadiazine and chlorhexidine groups were respectively 2.04 ± 4.27, 2.04 ± 3.65; 1.85 ± 3.37, 1.37 ± 2.35, p value 0.92). Daily dressing category showed slightly less pin site infection days rate within each group and overall, but this was
marginally less in chlorhexidine group; but was not statistically significant compared to other antiseptics and control group (Absolute value in control, povidone iodine, silver sulphadiazine and chlorhexidine groups were respectively 2.04 ± 4.27, 2.04 ± 3.65; 1.85 ± 3.37, 1.37 ± 2.35, p value 0.92). Daily dressing category showed slightly less pin site infection days rate within each group and overall, but this was also not statistically
marginally less in chlorhexidine group; but was not statistically significant compared to other antiseptics and control group (Absolute value in control, povidone iodine, silver sulphadiazine and chlorhexidine groups were respectively 2.04 ± 4.27, 2.04 ± 3.65; 1.85 ± 3.37, 1.37 ± 2.35, p value 0.92). Daily dressing category showed slightly less pin site infection days rate within each group and overall, but this was also not statistically significant (1.56 ± 3.99)
marginally less in chlorhexidine group; but was not statistically significant compared to other antiseptics and control group (Absolute value in control, povidone iodine, silver sulphadiazine and chlorhexidine groups were respectively 2.04 ± 4.27, 2.04 ± 3.65; 1.85 ± 3.37, 1.37 ± 2.35, p value 0.92). Daily dressing category showed slightly less pin site infection days rate within each group and overall, but this was also not statistically

sulphadiazine and 5 % chlorbexidine dressing with 5% chlorhexidine dressing alone. Method: This was a prospective controlled study which compared the results of pin site dressing using a combination of chlorhexidine and silver sulphadiazine cream (Study group) with dressing using chlorhexidine alone.	35. Ogbemudia AO, Bafor A, Edomwonyi E, Enemudo R.	Prevalence of pin tract infection: the role of combined silver sulphadiazine and chlorhexidine dressing. Niger J Clin Pract. 2010 Sep;13(3):268-71. PMID: 20857782.	value 0.35). There was no statistically significant difference among the groups with regard to other secondary outcomes. Methicillin Sensitive Staphylococcus aureus was the most common bacterial pathogen isolated. Conclusion: Use of antisepties does not offer any advantage in regular pin site care in Ilizarov external fixation and daily pin site care is not superior to weekly pin site care. Empirical therapy in early and low grade pin site infections must be targeted against Staphylococcus. Objective: Infection at the pin tract is a common complication of external fixation. This study was done to compare the rate of pin site infection following combined 1% silver	RCT	YES	YES N
Eligible patients had external fixation in the treatment of open fractures or orthopaedic conditions. Pin-tract infection was deemed to be present iferythema, cellulitis or		role of combined silver sulphadiazine and chlorhexidine dressing. Niger J Clin Pract. 2010 Sep;13(3):268-71.	fixation and daily pin site care is not superior to weekly pin site care. Empirical therapy in early and low grade pin site infections must be targeted against Staphylococcus. Objective: Infection at the pin tract is a common complication of external fixation. This study was done to compare the rate of pin site infection following combined 1% silver sulphadiazine and 5 % chlorbexidine dressing with 5% chlorhexidine dressing alone. Method: This was a prospective controlled study which compared the results of pin site dressing using a combination of chlorhexidine and silver sulphadiazine cream (Study group) with dressing using chlorhexidine alone. Eligible patients had external fixation in the treatment of open fractures or orthopaedic conditions. Pin-tract infection was deemed to be present	RCT	YES	YES N

		site. We did not			
		distinguish between			
		deep and superficial			
		infection.			
		Results: The study			
		group had one hundred			
		and seventy pin sites			
		while the control group			
		had one hundred and			
		sixty-four pin sites.			
		Thirty-eight patients, in			
		whom thirty-seven			
		uniplanar external			
		fixators and one			
		Ilizarov ring fixator			
		were used, made up			
		both groups. Three			
		patients (7.9%) had pin			
		tract infection in the			
		study group while nine			
		patients (23.7%) had			
		pin tract infection in the			
		control group.			
		Conclusion: There was			
		a significantly lower			
		prevalence of pin-tract			
		infection amongst			
		patients whose external			
		fixation pins were			
		dressed with 1% silver			
		sulphadiazine and 5%			
		chlorhexidine than in			
		those dressed with			
		chlorhexidine alone (P			
		= 0.03). Therefore, we			
		advocate the use of a			
		combination of silver			
		chlorhexidine for pin			
2/ 0/ 11/ 3/ 0 1: 0 1	A D 1 '. 1 O' ' 1 77' 1	site dressing.	D.CT	VEC	NEC.
36. Sácnz-Jalón M, Sarabia-Cobo	A Randomized Clinical Trial on the	Pin-site infections	RCT	YES	YES
CM, Roscales Bartolome E,	Use of Antiseptic Solutions for the	remain a common			
Santiago Fernández M, Vélez	Pin-Site Care of External Fixators:	clinical complication in			
B, Escudero M, Miguel ME,	Chlorhexidine-Alcohol Versus	patients with external			
Artabe P, Cabañas I,	Povidone-Iodine. J Trauma Nurs.	fixators. Pin-site care is			
Fernández A, Garcés C,	2020 May/Jun;27(3):146-150. doi:	commonly performed			
Couceiro J.	10.1097/JTN.000000000000503.	with either			
	PMID: 32371731.	chlorhexidine-alcohol			
		solution or povidone-			
		iodine solution. This			
		study aimed to			
		investigate the			
		superiority of			
		chlorhexidine-alcohol			
		solution versus			
		povidone-iodine			
		solution for external			

invalue pro-site case in prospective randomized eliminatival using an open, passilla group design. was conducted in a simple Spanish. hospital Ligible consenting passents——from Newconduct of the Parkers were randomly assigned to receive included Parkers were advised to the receive parkers. When he was the development of a plus desired to the receive assigned to the randomly assignment of the providence define assisted TKA was not the providence define assisted TKA assisted TKA was not the providence define assisted TKA assisted TKA was not the providence define assisted TKA assisted TKA was not the providence define assisted TKA result in parkers. 37. Kim YH, Yoon SH, Park JW. 38. Kim YH, Yoon SH, Park JW. 38. Kim YH, Yoon SH, Park JW. 39. Does Roboric assisted TKA Result in Parkers were carefully assisted to the randomly assisted to the randoml						
properties rendemined chircial read soing an open parallel group design was established in a single Spanish hospital Higglide consenting potients from November 2410-140-0May 2019 who underwent placement of an external finance were included Patients were modernly assigned to receive private care using other a 200 chirthreadthe selectual solutions of a 100 periodical indicate within the controlled solutions of a 100 periodical indicate within The patinary endpoint was the development of a pin site of the controlled finance of the cont			fixator pin-site care in			
prospective randomined clinical trial using an open parallel group design was emalusted in a simple pranish hospital. Higible consensing patients from Powember 2418 to May 2019 who undervent placement of an external fisator were included. Platints were randomly assigned to receive pin vite one using either a 2% elaborhexidine eleubol solution or a 10% povidance isdine solution. The primary endpoint was the development of a pin- site inflation. In total, 568 prim were analyzed (128 patients, with a mean of 4.3 pins per patient). No againfrom differences were found between groups However, statistically significant differences were found requiring eine and inflation variable. The Junge the person hald—the finance, the higher-the risk of infliction, (t) 5-509, p. — 0.02. Buth chlorhexiden slicibil and powidane ionline solutions as equally effective annisepte agents for the finance, the higher-the risk of inflictions in external finance in external strains are equally effective annisepte agents for the prevention of micetons in external than Conventional TKA? A Randomized, Controlled Trial. Clin Orthop Relat Res. 20(2) Feb;78(2):266-275. doi: 10.1097/CORR.0000000000000016. Ferratum in Ciln Orthop Relat Res. 20(2) Jun 14;79(6):1407. PMID) 3138(89):PMCID. PMCT/S48149. 3138(89):PMCID. PMCT/S48149.			pin-site infection. This			
sandomized christeria to toma year open parallel genup design was considered in a single Spanish hospital Highest concenting patients from November 2018 to May 2019 who undervett phecement of an external finance were meladed Hainetts were randomly assigned to receive planette care using either a 200 chlorhospita was delicition or a 140% povidion-indime solution. The primary endpoint was the development of a pin site infection in the primary endpoint was the development of a pin site infection. In other 360 pins were analyzed (100 pins per analyz						
susing an open, parallel group—design was conducted—in a single bynamish—hospital. Highlide—consenting patients—from November 2418 to May 2019—who undereven placement of an external fisation were included. Patents—were randomly—assigned—to receive pin-vite case using either a 20% eldorine-admentation of a 10% povidion-circline working of a 10% povidion-circline working—assigned—to receive pin-vite case using either a 20% eldorine-admentation of a 10% povidion-circline working—to a 10% povidion-circline working—to a 10% povidion-circline working—to a pin-site infection. In total, 568 pins—were analyzed (128-patients, with—a mean of 43-pins per patient). No significant differences were found between groups—However, satastistically significant differences were found espacing time—and—infection working—to a 10% povidion-circline working—to a 10% pins—to a 10% povidion-circline working—to a 10% povidion-circline worki			randomized clinical trial			
group design was endetected in a single Sparish hospital: Hightle coscining patients from November 2014 bits to My 2019 who underwent placement of an external fisation were included. Patients were randomly assigned to receive present care using citize are using citize as 2% elsevitors with each of the period of the citizens and the period of the peri						
sendured—in — single prairies hospital Highlide consenting patients from New miles 2014 th May 2010—who underevent placement of an external frastrar ware included. Patients were included. Patients were randomly assigned to receive phosine core using—white—a 2% elaboration or a 10% providence solution. The primary endpoint was — the development of a plus site microtion. The primary endpoint was — the development of a plus site microtion. The primary endpoint was — the development of a plus site microtion. The primary endpoint was — the development of a plus site microtion. The primary endpoint was — the development of a plus site microtion. The primary endpoint was — the development of a plus site microtion. The primary endpoint was — the development of a plus site microtion. The primary endpoint was — the development of a plus site microtion. The primary endpoint was — the development of a plus site microtion. The primary endpoint was — the development of a plus site microtion. The primary endpoint was the development of a plus site microtion. The primary endpoint was the development of a plus site microtion. The primary endpoint was the development of a plus site microtion. The primary endpoint was the development of a plus site microtion. The primary endpoint was the development of a plus site microtion. The primary endpoint was the development of a plus site microtion. The primary endpoint was the development of a plus site microtion. The primary endpoint was the development of a plus site microtion of a plus site microtion of a plus site microtion. The primary endpoint was the development of a plus site microtion o			using an open, paraner-			
Symmetry Boundary Street Stree						
November 2018 to May 2019—who underwent placement of an external fixator—were included. Patients—even enabled of a placement of an external fixator—were included. Patients—even enabled of a placement o						
November 2018 to May 2019—who underwent placement of an external fixator—were included. Patients—even enabled of a placement of an external fixator—were included. Patients—even enabled of a placement o			Spanish hospital.			
November 2018 to May 2019—who underwent placement of an external fixator—were included. Patients—even enabled of a placement of an external fixator—were included. Patients—even enabled of a placement o			Elieible consentine			
2019 who undervent placement of an external fusion were included. Patients were randomly assigned to receive principle care using either a 2% elikultustine discholt solution or a 10% povedone iodine solution. The primary endpoint was the development of a pin-site infection. In totals 56% prins were analyzed (128 patients, with a mean of 1.6 pins per patient). No significant differences were found between groups. However, statistically significant differences were found between groups. However, statistically significant differences were found regarding time and infection variables. The longer the person had the feature, the higher she risk of infections, (%) 5.49, p. = 0.02. Both ethics distinct and principles of the prevention of a feature, the higher she risk of infections of the prevention o			patients from			
37. Kim YH, Yoon SH, Park JW. Does Robotic-assisted TKA Result in Better Outcome Scores or Long-Term Survivorship Than Conventional TKA? A Randomized, Controlled and providence desires of the prevention of the fraction, the lighter the conventional TKA? A Randomized, Controlled Trial Clin Corthop Relat Res. 2021 Jun 1479(6):1407. PMID: 31398989; PMICID: PMID: 31399898; PMID: PMID: 31			N 1 2010 M			
placement of an external fission were included. Patients were michaely suspend to receive prinsite care using either a 2% ethorhesadine alcohol solution. The primary endpoint was the development of a pin-site infection. In total, 566 pins were analyzed (128 patients, with a meno of 1.3 pins per patient). No significant differences were found between groups. However, statistically significant differences were found between groups. However, statistically significant differences were found between groups. The longer the person had the findential read in faction and infection variables. The longer the person had the findential read in the first person had the findential read in faction and povidone iodine solutions are equally effective antisprie spents for the prevention of infections in external TKA2 A Randomized, Controlled Trial. Clin Orthop Relat Res. 2020. Feb;478(2):266-275. doi: 10.1097/CORR.000000000000016. Erranum in Clin Orthop Relat Res. 2021. Jun 1;479(6):1407. PMID: 3189889; PMCID: PMCIA/938149. 31. Kim YH, Yoon SH, Park JB. 32. Lim YH, Yoon SH, Park JB. 33. Kim YH, Yoon SH, Park JB. 34. Lim YH, Yoon SH, Park JB. 35. Kim YH, Yoon SH, Park JB. 36. Although The Although SS are accounted to encounter the precision of the precision of bone preparation and component alignment with the goal of improving the clinical sustained and survivorship of TKA. Although						
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37. Kim YH, Yoon SH, Park JW. Does Robotic-assisted TKA Result in Better Outcome Scores or Long-Term Survivorship Than Conventional TKA? A Randomized, Controlled Trial. Clin Orthop Relat Res. 2020 Feb;478(2):266-275. 10.1097/CORR.0000000000000016. Erratum in: Clin Orthop Relat Res. 2021 Jun 1;479(6):1407. PMID: 31389889; PMCID: PMC7438149. effective antiseptic agents for the prevention and infections in external fixators. Background: Robotic-assisted TKA was introduced to enhance the precision of bone preparation and component alignment with the goal of improving the clinical results and survivorship of TKA. Although			fixator, the higher the risk of infection, $t(x) = 5.49$, $p = .002$. Both chlorhexidine alcohol			
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37. Kim YH, Yoon SH, Park JW. Does Robotic-assisted TKA Result in Better Outcome Scores or Long-Term Survivorship Than Conventional TKA? A Randomized, Controlled Trial. Clin Orthop Relat Res. 2020 Feb;478(2):266-275. doi: 10.1097/CORR.000000000000000016. Erratum in: Clin Orthop Relat Res. 2021 Jun 1;479(6):1407. PMID: 31389889; PMCID: PMC7438149. of TKA. Although			fixator, the higher the risk of infection, t(x) = 5.49, p = .002. Both chlorhexidine alcohol and povidone iodine solutions are equally effective antiseptic			
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Survivorship Than Conventional TKA? A Randomized, Controlled Trial. Clin Orthop Relat Res. 2020 Feb;478(2):266-275. doi: 10.1097/CORR.00000000000000000000000000000000000	37 Kim VH Voog SH Dark IW	Door Robotic assisted TVA Possilt in	fixator, the higher the risk of infection, t(x) = 5.49, p = .002. Both chlorhexidine alcohol and povidone iodine solutions are equally effective antiseptic agents for the prevention of infections in external fixators.	PCT.	VES	NIA
TKA? A Randomized, Controlled Trial. Clin Orthop Relat Res. 2020 Feb;478(2):266-275. doi: 10.1097/CORR.00000000000000016. Erratum in: Clin Orthop Relat Res. 2021 Jun 1;479(6):1407. PMID: 31389889; PMCID: PMC7438149. the precision of bone preparation and component alignment with the goal of improving the clinical results and survivorship of TKA. Although	37. Kim YH, Yoon SH, Park JW.		fixator, the higher the risk of infection, t(x) = 5.49, p = .002. Both chlorhexidine alcohol and povidone iodine solutions are equally effective antiseptic agents for the prevention of infections in external fixators. Background: Robotic-	RCT	YES	NO
Trial. Clin Orthop Relat Res. 2020 Feb;478(2):266-275. doi: 10.1097/CORR.00000000000000016. Erratum in: Clin Orthop Relat Res. 2021 Jun 1;479(6):1407. PMID: 31389889; PMCID: PMC7438149. preparation and component alignment with the goal of improving the clinical results and survivorship of TKA. Although	37. Kim YH, Yoon SH, Park JW.	Better Outcome Scores or Long-Term	fixator, the higher the risk of infection, t(x) = 5.49, p = .002. Both chlorhexidine alcohol and povidone iodine solutions are equally effective antiseptic agents for the prevention of infections in external fixators. Background: Roboticassisted TKA was	RCT	YES	NO
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Feb;478(2):266-275. doi: component alignment with the goal of improving the clinical results and survivorship of TKA. Although	37. Kim YH, Yoon SH, Park JW.	Better Outcome Scores or Long-Term Survivorship Than Conventional	fixator, the higher the risk of infection, t(x) = 5.49, p = .002. Both chlorhexidine alcohol and povidone iodine solutions are equally effective antiseptic agents for the prevention of infections in external fixators. Background: Roboticassisted TKA was introduced to enhance	RCT	YES	NO
10.1097/CORR.000000000000000016. Erratum in: Clin Orthop Relat Res. 2021 Jun 1;479(6):1407. PMID: results and survivorship of TKA. Although	37. Kim YH, Yoon SH, Park JW.	Better Outcome Scores or Long-Term Survivorship Than Conventional TKA? A Randomized, Controlled	fixator, the higher the risk of infection, t(x) = 5.49, p = .002. Both chlorhexidine alcohol and povidone iodine solutions are equally effective antiseptic agents for the prevention of infections in external fixators. Background: Roboticassisted TKA was introduced to enhance the precision of bone	RCT	YES	NO
Erratum in: Clin Orthop Relat Res. improving the clinical results and survivorship of TKA. Although	37. Kim YH, Yoon SH, Park JW.	Better Outcome Scores or Long-Term Survivorship Than Conventional TKA? A Randomized, Controlled Trial. Clin Orthop Relat Res. 2020	fixator, the higher the risk of infection, t(x) = 5.49, p = .002. Both chlorhexidine alcohol and povidone iodine solutions are equally effective antiseptic agents for the prevention of infections in external fixators. Background: Roboticassisted TKA was introduced to enhance the precision of bone preparation and	RCT	YES	NO
2021 Jun 1;479(6):1407. PMID: results and survivorship of TKA. Although	37. Kim YH, Yoon SH, Park JW.	Better Outcome Scores or Long-Term Survivorship Than Conventional TKA? A Randomized, Controlled Trial. Clin Orthop Relat Res. 2020 Feb;478(2):266-275. doi:	fixator, the higher the risk of infection, t(x) = 5.49, p = .002. Both chlorhexidine alcohol and povidone iodine solutions are equally effective antiseptic agents for the prevention of infections in external fixators. Background: Robotic-assisted TKA was introduced to enhance the precision of bone preparation and component alignment	RCT	YES	NO
31389889; PMCID: PMC7438149. of TKA. Although	37. Kim YH, Yoon SH, Park JW.	Better Outcome Scores or Long-Term Survivorship Than Conventional TKA? A Randomized, Controlled Trial. Clin Orthop Relat Res. 2020 Feb;478(2):266-275. doi: 10.1097/CORR.00000000000000916.	fixator, the higher the risk of infection, t(x) = 5.49, p = .002. Both chlorhexidine alcohol and povidone iodine solutions are equally effective antiseptic agents for the prevention of infections in external fixators. Background: Robotic-assisted TKA was introduced to enhance the precision of bone preparation and component alignment with the goal of	RCT	YES	NO
31389889; PMCID: PMC7438149. of TKA. Although	37. Kim YH, Yoon SH, Park JW.	Better Outcome Scores or Long-Term Survivorship Than Conventional TKA? A Randomized, Controlled Trial. Clin Orthop Relat Res. 2020 Feb;478(2):266-275. doi: 10.1097/CORR.0000000000000916. Erratum in: Clin Orthop Relat Res.	fixator, the higher the risk of infection, t(x) = 5.49, p = .002. Both chlorhexidine alcohol and povidone iodine solutions are equally effective antiseptic agents for the prevention of infections in external fixators. Background: Robotic-assisted TKA was introduced to enhance the precision of bone preparation and component alignment with the goal of improving the clinical	RCT	YES	NO
	37. Kim YH, Yoon SH, Park JW.	Better Outcome Scores or Long-Term Survivorship Than Conventional TKA? A Randomized, Controlled Trial. Clin Orthop Relat Res. 2020 Feb;478(2):266-275. doi: 10.1097/CORR.00000000000000916. Erratum in: Clin Orthop Relat Res. 2021 Jun 1;479(6):1407. PMID:	fixator, the higher the risk of infection, t(x) = 5.49, p = .002. Both chlorhexidine alcohol and povidone iodine solutions are equally effective antiseptic agents for the prevention of infections in external fixators. Background: Robotic-assisted TKA was introduced to enhance the precision of bone preparation and component alignment with the goal of improving the clinical	RCT	YES	NO
Topoto Topoto	37. Kim YH, Yoon SH, Park JW.	Better Outcome Scores or Long-Term Survivorship Than Conventional TKA? A Randomized, Controlled Trial. Clin Orthop Relat Res. 2020 Feb;478(2):266-275. doi: 10.1097/CORR.00000000000000916. Erratum in: Clin Orthop Relat Res. 2021 Jun 1;479(6):1407. PMID:	fixator, the higher the risk of infection, t(x) = 5.49, p = .002. Both chlorhexidine alcohol and povidone iodine solutions are equally effective antiseptic agents for the prevention of infections in external fixators. Background: Robotic-assisted TKA was introduced to enhance the precision of bone preparation and component alignment with the goal of improving the clinical results and survivorship	RCT	YES	NO
	37. Kim YH, Yoon SH, Park JW.	Better Outcome Scores or Long-Term Survivorship Than Conventional TKA? A Randomized, Controlled Trial. Clin Orthop Relat Res. 2020 Feb;478(2):266-275. doi: 10.1097/CORR.00000000000000916. Erratum in: Clin Orthop Relat Res. 2021 Jun 1;479(6):1407. PMID:	fixator, the higher the risk of infection, t(x) = 5.49, p = .002. Both chlorhexidine alcohol and povidone iodine solutions are equally effective antiseptic agents for the prevention of infections in external fixators. Background: Robotic-assisted TKA was introduced to enhance the precision of bone preparation and component alignment with the goal of improving the clinical results and survivorship of TKA. Although	RCT	YES	NO

suggest that bone
preparation and knee
component alignment
may be improved using
robotic assistance, no
long-term randomized
trials of robotic-assisted
TKA have shown
whether this results in
improved clinical
function or
survivorship of the
TKA.
Questions/purposes:
In this randomized trial,
we compared robotic-
assisted TKA to
manual-alignment
techniques at long-term
follow-up in terms of
(1) functional results
based on Knee Society,
WOMAC, and UCLA
Activity scores; (2)
numerous radiographic
parameters, including
component and limb
alignment; (3) Kaplan-
Meier survivorship; and
(4) complications
specific to robotic-
assistance, including
pin-tract infection,
peroneal nerve palsy,
pin-site fracture, or
patellar complications.
Methods: This study
was a registered
prospective,
randomized, controlled
trial. From January
2002 to February 2008,
one surgeon performed
975 robotic-assisted
TKAs in 850 patients
and 990 conventional
TKAs in 849 patients.
Among these patients
1406 patients were
eligible for participation
in this study based on
prespecified inclusion
criteria. Of those, 100%
(1406) patients agreed
to participate and were
randomized, with 700
patients (750 knees)

receiving robotic-
assisted TKA and 706
patients (766 knees)
receiving conventional
TKA. Of those, 96%
(674 patients) in the
robotic-assisted TKA
group and 95% (674
patients) in the
conventional TKA
group were available for
follow-up at a mean of
13 (± 5) years. In both
groups, no patient older
than 65 years was
randomized because we
anticipated long-term
follow-up. We
evaluated 674 patients
(724 knees) in each
group for clinical and
radiographic outcomes,
and we examined
Kaplan-Meier
survivorship for the
endpoint of aseptic
loosening or revision.
Clinical evaluation was
performed using the
original Knee Society
knee score, the
WOMAC score, and
the UCLA activity
score preoperatively
and at latest follow-up
visit. We also assessed
loosening (defined as
change in the position
of the components)
using plain radiographs,
osteolysis using CT
scans at the latest
follow-up visit, and
component, and limb
alignment on
mechanical axis
radiographs. To
minimize the chance of
type-2 error and
increase the power of
our study, we assumed
the difference in the
Knee Society score to
be 25 points to match
the MCID of the Knee
Society score with a SD
of 5; to be able to detect
a difference of this size,
we calculated that a

total of 628 patients
would be needed in
each group in order to
achieve 80% power at
the $\alpha = 0.05$ level.
the wood level.
Results: Clinical
parameters at the latest
follow-up including the
Knee Society knee
scores (93 ± 5 points in
the robotic-assisted
TKA group versus 92 ±
6 points in the
conventional TKA
group [95% confidence
interval 90 to 98]; p =
0.321) and Knee
Society knee function
scores (83 ± 7 points in
the robotic-assisted
TKA group versus 85 ±
6 points in the
conventional TKA
group [95% CI 75 to
88]; p = 0.992), WOMAC scores (18 ±
14 points in the
robotic-assisted TKA
group versus 19 ± 15 points in the
conventional TKA
group [95% CI 16 to
22]; p = 0.981), range of knee motion (125 \pm 6°
in the robotic-assisted
TKA group versus 128 ± 7° in the
± 7° in the conventional TKA
group [95% CI 121 to
135]; p = 0.321), and UCLA patient activity
scores (7 points versus
7 points in each group
/ points in each group
1.000) were not different between the
two groups at a mean of
13 years' follow-up.
Radiographic
parameters such as the femorotibial angle
(mean 2° ± 2° valgus in the robotic-assisted
TKA group versus 3° ±
3° valgus in the
conventional TKA
group [95% CI 1 to 5];
p = 0.897), femoral

component position
(coronal plane: mean
98° in the robotic-
assisted TKA group
versus 97° in the
conventional TKA
group [95% CI 96 to
99]; p = 0.953; sagittal
plane: mean 3° in the
robotic-assisted TKA
group versus 2° in the
conventional TKA
group [95% CI 1 to 4];
p = 0.612) and tibial
component position
(coronal plane: mean
90° in the robotic-
assisted TKA group
versus 89° in the
conventional TKA
group [95% CI 87 to
92]; p = 0.721; sagittal
92], p = 0.721; sagntal plane: 87° in the
robotic-assisted TKA
group versus 86° in the
conventional TKA
group [95% CI 84 to
89]; p = 0.792), joint
line (16 mm in the
robotic-assisted TKA
group versus 16 mm in
the conventional TKA
group [95% CI 14 to
18]; $p = 0.512$), and
posterior femoral
condylar offset (24 mm
in the robotic-assisted
TKA group versus 24
mm in the conventional
TKA group [95% CI 21]
to 27]; $p = 0.817$) also
were not different
between the two groups
(p > 0.05). The aseptic
loosening rate was 2%
in each group, and this
was not different
between the two
groups. With the
endpoint of revision or
aseptic loosening of the
components, Kaplan-
Meier survivorship of
the TKA components
was 98% in both
groups (95% CI 94 to
100) at 15 years (p =
0.972). There were
,

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38. Luwang AL, Saha PK,	Chlorhexidine-alcohol versus	Objectives: To	RCT	YES	NO
Rohilla M, Sikka P, Saha L,	povidone-iodine as preoperative skin	compare the efficacy of chlorhexidine-alcohol			
Gautam V.	antisepsis for prevention of surgical site infection in cesarean delivery-a	and povidone-iodine as			
	pilot randomized control trial. Trials.	preoperative antiseptic			
	2021 Aug 17;22(1):540. doi:	skin preparation for			
	10.1186/s13063-021-05490-4. PMID:	prevention of surgical			
	34404473; PMCID: PMC8369632.	site infection (SSI) after			
	54404475, 1 MCID. 1 MC65050522.	cesarean delivery (CD).			
		cesarean denvery (CD).			
		Materials and methods:			
		A total of 311 eligible			
		women who underwent			
		CS were recruited in the			
		study after fulfilling all			
		the eligibility and			
		exclusion criteria.			
		Patients were			
		randomized into two			
		groups (153 in			
		chlorhexidine-alcohol			
		group and 158 in			
		povidone-iodine group)			
		by a computer-			
		generated			
		randomization table.			
		Patients were followed			
		for a period of 30 days			
		in postoperative period			
		to monitor for SSI.			
		Results: The rate of SSI			
		in the chlorhexidine-			
		alcohol group is 5.4%			
		and that of the			
		povidone-iodine-group			
		is 8.6%. E. coli, K.			
		pneumoniae, and			
		Acinetobacter			
		baumannii were the			
		most common			
		organisms isolated. E.			
		coli was found in 9.5%			
		of the total SSI cases.			
		C1 T1			
		Conclusions: The study			
		found that the patients			
		who received chlorhexidine-alcohol			
		as skin antiseptic had less chance of			
		developing SSI than			
		those who received			
		povidone-iodine;			
		however, it did not reach a statistical			
				1	1
		significance			
39. Ferguson D, Harwood P,	The PINS Trial: a prospective	significance. Aims: Pin-site infection	RCT	YES	YES

			<u> </u>	T
Taylor M, Moulder I		problem for patients		
Sharma H.	regimen for the care of pin-sites in	treated by external		
	patients with circular frames. Bone	fixation. A randomized		
	Joint J. 2021 Feb;103-B(2):279-285.	trial was undertaken to		
	doi: 10.1302/0301-620X.103B2.BJJ-	compare the weekly use		
	2020-0680.R1. PMID: 33517738.	of alcoholic		
		chlorhexidine (CHX)		
		for pin-site care with an		
		emollient skin		
		preparation in patients		
		with a tibial fracture		
		treated with a circular		
		frame.		
		Tranic.		
		M-41- 1- D-4: -4		
		Methods: Patients were		
		randomized to use		
		either 0.5% CHX or		
		Dermol (DML) 500		
		emollient pin-site care.		
		A skin biopsy was taken		
		from the tibia during		
		surgery to measure the		
		dermal and epidermal		
		thickness and capillary,		
		macrophage, and T-cell		
		counts per high-		
		powered field. The pH		
		and hydration of the		
		skin were measured		
		preoperatively, at		
		follow-up, and if pin-		
		site infection occurred.		
		Pin-site infection was		
		defined using a		
		validated clinical		
		system.		
		Results: Out of 116		
		patients who were		
		enrolled in the study, 23		
		patients (40%) in the		
		CHX group and 26		
		(44%) in the DML		
		group had at least one		
		bad or ugly pin-site		
		infection. This		
		difference was not		
		statistically significant		
		$\frac{\text{statistically}}{\text{(p} = 0.71)}$. There was		
		no significant		
		relationship between		
		pH or hydration of the		
		skin and pin-site		
		infection. The		
		epidermal thickness		
		was found to be		
		significantly greater in		
		patients who had a pin-		
		site infection compared		

	<u></u>				T
40. Sidhu VS, Cheng TL, Lillia J, Bridge C, Little DG, Gray RJ.	3D printed models can guide safe halo pin placement in patients with diastrophic dysplasia. Spine Deform. 2021 May;9(3):841-849. doi: 10.1007/s43390-020-00269-0. Epub 2021 Jan 19. PMID: 33464553.	with those who did not (p = 0.01). Skin irritation requiring a change of treatment occurred in four patients (7%) using CHX, and none using DML: Conclusion: We found no significant difference in the incidence of pin site infection between the CHX and DML treatment groups. Dermol appeared to offer a small but significant advantage in terms of tolerability. We did not find a significant association between patient or treatment related factors and pin site infection. It is therefore difficult to make specific recommendations based upon these results. The use of either cleaning agent appears to be appropriate. Cite this article: Bone Joint J 2021;103 B(2):279 285. Purpose: To trial the use of three-dimensional (3D) printed skull models to guide safe pin placement in two patients with diastrophic dysplasia (DTD) requiring prolonged pre-fusion halo-gravity traction (HGT). Methods: Two sisters aged 8 (ML) and 4 (BL) with DTD were	Clinical Trial	YES	NO
		(HGT). Methods: Two sisters			

		computer tomography			
		(CT) scans using			
		Mimics Innovation			
		Suite and printed on a			
		Guider II in polylactic			
		acid. The 3D models			
		were cut axially			
		proximal to the skull			
		equator, in-line where			
		pins are usually			
		inserted, allowing			
		identification of the			
		thickest skull portion to			
		guide pin placement.			
		guide più piacement.			
		D 1. E'1. '			
		Results: Eight pins were			
		inserted into each			
		patient's skull.			
		Postoperative CT scans			
		demonstrated adequate			
		pin position. Pre-			
		traction Cobb angles			
		were 122° and 128° for			
		ML and BL, improving			
		to 83° and 86°			
		following traction.			
		Duration of HGT was			
		182 and 238 days for			
		ML and BL. Prior to			
		fusion, both patients			
		returned to theatre			
		twice for exchange of			
		loose pins and there			
		was one incidence of			
		pin site infection.			
		Surgery was performed			
		via a posterior			
		instrumented fusion.			
		Postoperatively, both			
		patients remained in			
		their halos for 3			
		months. One pin in BL			
		was removed for			
		loosening. Both			
		patients achieved			
		fusion union by 9			
		months.			
		Conclusion: 3D models			
		of the skull can be a			
		useful tool to guide safe			
		pin placement in			
		patients with skeletal			
		dysplasias, who require			
		prolonged pre-fusion			
		HGT for severe			
		deformity correction.		1	_
41. Bhattacharjee S, Chattaraj S.	Entry, infection, replication, and egress	Polyomaviruses (PyVs),	Review	YES	NO
			ICCVICW	1123	
	of human polyomaviruses: an update.	belonging to the family	Review	1123	

Can J Microbiol. 2017 Mar;63(3):193-	Polyomaviridae, are a	
211. doi: 10.1139/cjm-2016-0519.	group of small,	
Epub 2016 Oct 29. PMID: 28177804.	nonenveloped, double-	
Epub 2010 Oct 25. 1 Milb. 2017/004.	stranded, circular DNA	
	viruses widely	
	distributed in the	
	vertebrates. PyVs cause	
	no apparent disease in	
	adult laboratory mice	
	but cause a wide variety	
	of tumors when	
	artificially inoculated	
	into neonates or	
	semipermissive	
	animals. A few human	
	PyVs, such as BK, JC,	
	and Merkel cell PyVs,	
	have been	
	unequivocally linked to	
	pathogenesis under	
	conditions of	
	immunosuppression.	
	Infection is thought to	
	occur early in life and	
	persists for the lifespan	
	of the host. Over	
	evolutionary time	
	scales, it appears that	
	PyVs have slowly co-	
	evolved with specific	
	host animal lineages.	
	Host cell surface	
	glycoproteins and	
	glycolipids seem to play	
	a decisive role in the	
	entry stage of viral	
	infection and in	
	channeling the virions	
	+to specific	
	intracellular	
	membrane-bound	
	compartments and	
	ultimately to the	
	nucleus, where the	
	genomes are replicated	
	and packaged for	
	release. Therefore the	
	transport of the	
	infecting virion or viral	
	genome to this site of	
	multiplication is an	
	essential process in	
	productive viral	
	infection as well as in	
	latent infection and	
	transformation. This	
	review summarizes the	
	major findings related	
	to the characterization	
	to the characterization	1

		of the nature of the interactions between PyV and host protein and their impact in host cell invasion.			
42. Myatt A, Saleeb H, Robertson GAJ, Bourhill JK, Page PRJ, Wood AM.	Management of Gustilo-Anderson IIIB open tibial fractures in adults-a systematic review. Br Med Bull. 2021 Sep 10;139(1):48-58. doi: 10.1093/bmb/ldab013. PMID: 34227647.	and their impact in host cell invasion. Introduction: Open tibial fractures are the most common open long bone fracture, despite this, the management of these complex injuries still remains a topic of discussion amongst orthopaedic surgeons. Sources of data: We searched the EMBASE, MEDLINE and Google Scholar and a systematic review of 7500 articles, leaving 23 after exclusion criteria were applied, in order to analyse the management of open tibial fractures. Areas of agreement and controversy: Infection was noted to be the	Systematic review	YES	NO
		most significant concern amongst authors, with definitive external fixation having a high rate of superficial pin-site infection and internal fixation having a high deep infection rate.			
		Growing points: It is essential to have a combined ortho-plastic approach to the management of these fractures as muscle flaps were the most common form of soft tissue coverage.			
		Areas timely for developing research: A national pragmatic trial into the management of open tibial fractures is required looking at fixation methods and soft tissue coverage,			

		with at least a 2-year			
		follow-up in order to			
		ascertain the most			
		appropriate			
		management of these			
		fractures and patient-			
		related outcomes.			
43. Lee C, Sciadini M.	The Use of External Fixation for the	The objective of this	Review	YES	NO
	Management of the Unstable Anterior	article was to highlight			
	Pelvic Ring. J Orthop Trauma. 2018	the indications and			
	Sep;32 Suppl 6:S14-S17. doi:	various methods of			
	10.1097/BOT.0000000000001251.	external fixation for			
	PMID: 30095676.	management of the			
		unstable anterior pelvic			
		ring. Although most			
		often used temporarily			
		in the setting of			
		significant hemorrhage			
		from a pelvic ring			
		fracture, external			
		fixation remains an			
		option for definitive			
		stabilization of select			
		pelvic ring injuries.			
		Classically, the iliac			
		crest frame has been			
		used, although use of			
		the supra-acetabular			
		frame has gained favor			
		due to its superior bone			
		purchase and improved			
		biomechanics.			
		Common			
		complications from			
		external fixation			
		include pin site			
		infections, loss of			
		reduction, and the			
		"external fixator			
		deformity."			
44. Stewart RG, Hammer N,		Background: Unstable	Meta-	YES	NO
Kieser DC.	fractures: a systematic review and	pelvic fractures are	Analysis		
	meta-analysis. ANZ J Surg. 2019	typically caused by			
	Sep;89(9):1022-1027. doi:	high-impact trauma.			
	10.1111/ans.15027. Epub 2019 Feb	Early stabilization is			
	12. PMID: 30756458.	required to prevent			
		further neurological or			
		visceral injury,			
		haemorrhage, reduce			
		pain, infection and			
		long-term deformity			
		and disability. The aim			
		was to review the			
		optimal external			
		fixation techniques and			
		management for			
		unstable pelvic			
		fractures.			

Methods: A total of 28
studies were identified
from the initial database
search. Seventeen
studies met our
inclusion criteria - eight
prospective cohorts,
four retrospective
cohorts and five in vitro
studies. This equated to 539 patients and 38
cadaveric (in vitro)
models.
Results: Type B and
double vertical
fractures have less re-
displacement (43.7%
and 68.2% <5 mm, respectively) than Type
C fractures (55.7% >15
mm) regardless of pin
placement. Greater
than 50% experience a
complication with the
most common being
pin site infection (36%)
and a trend towards
increased infection with
increasing pins was seen. Most can be
managed with
antibiotics alone (93%).
A minimum time of 6-8
weeks in frame was
required for definitive
management of all
fractures.
Conclusion: This
review supports the use
of supra-acetabular pins
over iliac crest pins to
decrease re-
displacement, the least
number of pins for the
shortest amount of
time and the largest size
pin where possible. Type B fractures will
generally have a better
outcome than Type C
fractures. Definitive
management in a frame
should be at least 8
weeks. Further studies
directly comparing iliac
crest and supra-
acetabular pin

		placement are			
		placement are recommended.			
45. Suson KD, Sponseller PD,	Bony abnormalities in classic bladder	Introduction: As the	Review	YES	NO
Gearhart IP.	exstrophy: the urologist's perspective.		Review	153	
Geaman jr.	Pediatr Urol. 2013 Apr;9(2):112-22.	primary practitioner managing patients with			
		classic bladder			
	doi: 10.1016/j.jpurol.2011.08.007.				
	Epub 2011 Nov 21. PMID: 22105005.	exstrophy (CBE), it is			
		incumbent upon the			
		pediatric urologist to			
		understand the			
		associated orthopedic			
		anomalies and their			
		management.			
		Methods: A Pubmed			
		search was performed			
		with the keyword			
		exstrophy. Resulting			
		literature pertaining to			
		orthopedics and			
		published references			
		were reviewed.			
		Results: Anatomic			
		changes to the bony			
		pelvis include outward			
		rotation, acetabular			
		retroversion with			
		compensatory femoral anteversion, anterior			
		pubic shortening, and			
		pubic diastasis. Imaging			
		options have improved,			
		which impacts surgical			
		planning. Surgical			
		approach, including			
		type of osteotomy and method of pubic			
		approximation, is			
		evolving. Most centers			
		employ immobilization			
		after surgery, with external fixation,			
		Bryant's traction,			
		Buck's traction, and			
		spica casting being the			
		spica casting being the			
		most common methods. Orthopedic			
		complications range			
		from minor pin-site			
		infections to neurologic			
		and vascular			
		compromise. Most			
		experts agree			
		osteotomy aids bladder			
		closure beyond 72 h of			
		life, but effect on			
		continence remains			
		controversial. Although			

		no significant			
		orthopedic benefit has			
		been expounded, it may			
		be too early to			
		appreciate			
		improvement in			
		frequency or severity of			
		osteoarthritis or hip			
		dysplasia.			
		Conclusion: While			
		orthopedic surgeons			
		remain vital to			
		managing exstrophy			
		patients, knowledge of			
		the anatomy, imaging,			
		surgical approaches,			
		and immobilization			
		enable effective			
		communication with			
		parents and other			
		physicians, improving			
		care for these			
46 C 11 C VIII 1 P 1		complicated patients.	D.CT	MEC	VEO
	ine pin tract care in external	Introduction: Pin site	RCT	YES	YES
	on is unnecessary: a randomised,	infections are seen in up			
	pective, blinded controlled study.	to 40% of external			
Injury	y. 2012 Nov;43(11):1969-73. doi:	fixators (ExFix) and are			
10.10	016/j.injury.2012.08.010. Epub	therefore the most			
	Aug 16. PMID: 22901422.	common complication			
	8	with this device. There			
		is no consensus in the			
		literature as to the			
		appropriate regimen for			
		pin tract care and			
		infection prevention.			
		This study is the first			
		intra-subject,			
		randomised,			
		prospective controlled			
		trial comparing daily			
		pin tract care to no pin			
		tract care at all.			
		cract care at an.			
		Method: Consecutive			
		Method: Consecutive			
		patients series (56			
		patients series (56 patients, 16 female, age			
		patients series (56 patients, 16 female, age 4-68 y, mean 24 y, in			
		patients series (56 patients, 16 female, age 4-68 y, mean 24 y, in total 204 pins) recruited			
		patients series (56 patients, 16 female, age 4-68 y, mean 24 y, in total 204 pins) recruited in the National Referral			
		patients series (56 patients, 16 female, age 4-68 y, mean 24 y, in total 204 pins) recruited in the National Referral Hospital in Honiara in			
		patients series (56 patients, 16 female, age 4-68 y, mean 24 y, in total 204 pins) recruited in the National Referral Hospital in Honiara in the Solomon Islands			
		patients series (56 patients, 16 female, age 4-68 y, mean 24 y, in total 204 pins) recruited in the National Referral Hospital in Honiara in the Solomon Islands			
		patients series (56 patients, 16 female, age 4-68 y, mean 24 y, in total 204 pins) recruited in the National Referral Hospital in Honiara in			
		patients series (56 patients, 16 female, age 4-68 y, mean 24 y, in total 204 pins) recruited in the National Referral Hospital in Honiara in the Solomon Islands over a 2 year period. Exclusion criteria were			
		patients series (56 patients, 16 female, age 4-68 y, mean 24 y, in total 204 pins) recruited in the National Referral Hospital in Honiara in the Solomon Islands over a 2 year period. Exclusion criteria were application of ExFix			
		patients series (56 patients, 16 female, age 4-68 y, mean 24 y, in total 204 pins) recruited in the National Referral Hospital in Honiara in the Solomon Islands over a 2 year period. Exclusion criteria were application of ExFix for less than two weeks			
		patients series (56 patients, 16 female, age 4-68 y, mean 24 y, in total 204 pins) recruited in the National Referral Hospital in Honiara in the Solomon Islands over a 2 year period. Exclusion criteria were application of ExFix for less than two weeks or a non-standard			
		patients series (56 patients, 16 female, age 4-68 y, mean 24 y, in total 204 pins) recruited in the National Referral Hospital in Honiara in the Solomon Islands over a 2 year period. Exclusion criteria were application of ExFix for less than two weeks			

		groups anatomically,			
		proximal and distal.			
		Randomisation was			
		intra-subject and intra-			
		group: 101 pins had			
		daily pin site care and			
		103 had no treatment at			
		all.			
		Endpoints: Soft-tissue			
		interface, stability of the			
		pins, torsional stability			
		as determined with a			
		torque metre, osteolysis			
		and pain. Assessment			
		of pin sites blinded.			
		Statistical analysis using			
		the paired t test for			
		parametric data and the			
		Wilcoxon rank test for			
		non-parametric data			
		(Stat View).			
		Results: No significant			
		difference between the			
		two groups. Soft-tissue			
		interface 36% vs. 35%			
		(granulation/secretion),			
		stability 20 vs 25 pins			
		with loosening. No			
		significant osteolysis (7			
		vs. 6 pins). Torque:			
		mean 0.75 Nm, max.:			
		3.05 Nm vs. 0.60 Nm,			
		max.: 3.55 Nm, no			
		significant difference.			
		No differences in			
		demographics (age,			
		localisation, sex, time of			
		fixation).			
		Conclusion: This study			
		shows that routine pin			
		tract care is unnecessary			
		in external fixation			
		treatment of injuries.			
47. Vrouwe SQ, Pham CH,	Techniques for Patient Positioning	Introduction: Patient	Systematic	YES	NO
Gillenwater TJ,	During Burn Surgery: A Systematic	positioning in the	Review		
Yenikomshian HA.	Review. Ann Plast Surg. 2020	operating room			
	Jul;85(1):24-28. doi:	remains a challenge for			
	10.1097/SAP.0000000000002193.	burn surgeons; burn			
	PMID: 31913885.	surgery involves			
	1 19112. 31713003.	critically ill patients who			
		require close			
		monitoring, difficult			
		1 6.1			
		exposures, and careful			
		handling of grafted			
		handling of grafted areas. Various			
		handling of grafted			

intraoperative
positioning during burn
surgery have been
described in the
literature. The aim of
this review was to
outline these
positioning techniques
and report on their
complications.
complications.
Methods: A systematic
review was performed
by 2 independent
reviewers using
PubMed, Scopus, and
OvidSP MEDLINE
databases. Articles were
included if they
described
intraoperative
techniques to position
patients undergoing
burn surgery. The
primary variable of
÷
complications related
to positioning during
surgery.
Results: The search
identified 1855
nonduplicate citations,
of which 29 underwent
full-text review, and 10
met inclusion criteria.
Three studies described
overhead suspension techniques, including a
hook-and-pulley
system, ceiling chains, weighted IV poles, and
mounted crossbars; no
complications were
reported. Six studies described limb fixation
techniques, including
Steinmann pins, finger
traps, wrist/ankle
wraps, towel clips
through eschar or distal
phalanges, and external
fixators. Complications
included one case of
hardware failure of
external fixation and
several pin site
infections. Four studies
described table

modification	
techniques, including a	
modified Stryker frame,	
a fracture table, the	
Mayfield headrest, and	
the recliner position; no	
complications were	
reported.	
Discussion: Numerous	
techniques have been	
described to improve	
patient positioning	
during burn surgery.	
No major	
complications were	
identified in this	
systematic review. Most	
techniques use standard	
operating room	
equipment and can aid	
in safe and easier	
operations.	
	IO
Kaltenhauser F, Schramm N, titanium alloy pins in external fixation purpose of this study	
Rubenbauer B, Greiner A, at the wrist: a controlled cohort study. was to analyze whether	
Piltz S. J Trauma. 2011 Apr;70(4):845-51. doi: the prevalence of pin-	
10.1097/TA.0b013e3181e97761. related complications	
PMID: 20805762. can be reduced by the	
use of hydroxyapatite	
(HA)-coated pins in	
external fixators applied	
for unstable wrist	
fractures.	
Methods: Forty patients	
(160 pins) were	
randomized for	
standard uniplanar	
fixator treatment with	
the use of identically	
designed pins either	
composed of titanium-	
alloy (Ti6Al4V) (n =	
20) or coated by HA (n	
= 20). Each pin site was	
clinically evaluated with	
regard to erythema,	
drainage, pain value,	
and radiologically	
assessed concerning	
loosening at T1 (mean,	
9 days), T2 (mean, 43	
days), and T3 (mean, 56	
days). In case of pin-	
track complication, the	
patient was followed	

		additional surgery was			
		documented. Bone			
		mineral density was			
		analyzed by Dual			
		Energy X-ray			
		Absorptiometry. At			
		fixator removal (T2),			
		the pin-extraction			
		strength was measured			
		by the use of a digital-			
		torque-wrench.			
		Results: Two minor			
		pin-track infections			
		requiring oral			
		antibiotics occurred in			
		the HA-pin group			
		(2.7%) (p > 0.05). The			
		vast majority of clinical			
		pin-site parameters			
		were comparable in			
		both groups. At the end			
		of the fixator therapy,			
		there were 16 loose pins			
		(n(Ti6AL4V-group) =			
		10; $n(HA-group) = 6$).			
		The rate of loose pins			
		was correlated to			
		patient's age (p < 0.05)			
		but not to bone mineral			
		density values or the			
		occurrence of pin-site			
		infection. Finally, no			
		significant difference			
		between the two groups			
		was detected with			
		regard to the prevalence			
		of clinical relevant pin-			
		site complications (p =			
		0.80).			
		Conclusions: In			
		external fixation of the			
		wrist, the use of HA-			
		coated pins yields no			
		clinical advantages:			
		there is a trend toward a			
		superior pin-bone			
		anchorage, but a			
		tendency of increased			
		susceptibility for minor			
		pin-track infections.			
49. Takahashi T, Baboolal TG,		Knee joint distraction	Review	YES	NO
Lamb J, Hamilton TW,	Treatment Option for Knee OA?-A	(KJD) is a new			_
Pandit HG.	Literature Review and Meta-Analysis. J	application of an			
	Knee Surg. 2019 Aug;32(8):788-795.	established technique			
	doi: 10.1055/s-0038-1669447. Epub	to regenerate native			
İ	1 doi: 10.1055/8-0050-100344/. Ebab	to regenerate manve	Ì		
		contiloro mai			
	2018 Aug 29. PMID: 30157528.	cartilage using an			
		cartilage using an external fixator. The			

purpose of this study is
to perform a systematic
review and meta-
analysis of the literature
to determine whether
KJD is beneficial for
knee osteoarthritis and
how results compare
with established
assessing the outcomes
of KJD were retrieved,
with three studies (one
cohort and two
randomized controlled
trials), 62 knees,
meeting the inclusion
criteria. The primary
outcome was functional
outcome, assessed
using a validated
outcome score, at 1
year. Secondary
outcomes included pain
scores, structural
assessment of the joint,
and adverse events.
KJD is associated with
improvements in
Western Ontario and
McMaster Universities
Osteoarthritis Index
(WOMAC) from
baseline to 1 year as
well as reductions in
pain scores and
improvements in
structural parameters
assessed
radiographically and by
magnetic resonance
imaging. KJD is not
associated with
decreased knee flexion,
but is associated with a
high risk of pin site
infection. In patients
aged 65 years or under
at 1 year, no differences
in WOMAC or pain
scores was detected
between patients
managed with KJD
compared with high
tibial osteotomy or total
knee arthroplasty. KJD
may represent a
potential treatment for
potential treatment for knee arthritis, though

		further trials with			
		longer term follow-up			
		are required to establish			
		its efficacy compared			
		with contemporary			
		treatments. This is a			
		Level I (systematic			
		review and meta-			
		analysis) study.			
50. Pieske O, Kaltenhauser F,	Clinical benefit of hydroxyapatite-	Background: The	RCT	YES	NO
Pichlmaier L, Schramm N,	coated pins compared with stainless	purpose of this study	KC1	1120	
Trentzsch H, Löffler T,	steel pins in external fixation at the	was to determine the			
Greiner A, Piltz S.	wrist: a randomised prospective study.	clinical benefit of			
	Injury. 2010 Oct;41(10):1031-1036.	hydroxyapatite (HA)-			
	doi: 10.1016/j.injury.2010.03.030.	coated pins compared			
	PMID: 20444448.	with standard stainless			
		steel pins in external			
		fixators applied for			
		unstable fractures of			
		the distal radius.			
		ui e distal facius.			
		Madada Arrit 640			
		Methods: A total of 40			
		patients (160 pins) with			
		unstable wrist fractures			
		were randomised for			
		uniplanar fixator			
		treatment with the use			
		of identically designed,			
		commercially available			
		pins either composed			
		of stainless steel (steel			
		$\frac{\text{group}}{\text{group}}$ $\frac{\text{(n = 20)}}{\text{or}}$			
		coated by			
		hydroxyapatite (HA			
		$\frac{\text{group}}{\text{group}}$ (n = 20). Each			
		pin site was clinically			
		evaluated concerning			
		erythema and grade of			
		drainage as well as pain			
		intensity (numeric			
		rating scale (NRS) 0-			
		10) and, additionally,			
		radiological assessment			
		was performed			
		concerning pin-			
		loosening/infection as			
		well as fracture healing			
		at T1 (Ø18 days), T2			
		(Ø44 days) and T3			
		(Ø65 days). In case of			
		pintrack complication,			
		the patient was			
		followed continuously.			
		The need for intensified			
		pin-site care, oral or			
		intravenous antibiotic			
		medication, re-			
		admission for			
		additional surgery and			
·	1	actentional surgery and		Ī	i

	premature fixator
	removal was
	documented. Bone
	mineral density (BMD)
	was determined by dual
	energy X-ray
	absorptiometry. At
	fixator removal (T2),
	the pin-extraction
	strength was measured
	by the use of an
	electronic torque
	wrench.
	Results: Two pin-track
	infections requiring
	daily pin-site care and
	oral antibiotics
	occurred in the HA
	group (2.6%) compared
	with four in the steel
	$\frac{\text{group} (5.3\%) (p = 1)}{(0.001) \text{ and although a signature}}$
	0.601) and although a
	trend towards a
	superior performance
	of HA pins was
	detectable, the majority
	of clinical pin-site-
	parameters were
	comparable in both
	groups. At the end of
	the fixator therapy, the
	HA group showed a
	non-significant lower
	rate of loose pins
	$\frac{\text{(n(steel group)} = 9;}{\text{(IIA)}}$
	$\frac{n(HA \text{ group}) = 6; p = 1}{n(HA \text{ group})}$
	0.864) and both
	hydroxyapatite-coated
	pins showed at the
	radius a significantly
	stronger pin-bone
	bonding measured by
	the torque wrench
	(p(proximal radius pin)
	= 0.007; p(distal radius
	pin) = 0.031). Except
	for elderly patients of
	the steel group (p =
	0.018), all
	domographic boolth
	demographic-, health-
	and injury-related data
	including BMD were
	not correlated to any
	type of pin-site
	complication in both
	groups (p > 0.05). Since
	all fracture healed
	uneventfully without
·	

		any type of additional			
		surgery, the number of			
		patients suffering			
		clinically relevant pin-			
		related complications			
		showed no significant			
		difference between			
		both groups (p =			
		0.707).			
		Conclusions: The use			
		of HA-coated pins			
		compared with			
		standard stainless-steel			
		pins in external fixation			
		for unstable wrist			
		fractures yields only a			
		trend towards a			
		superior clinical			
		outcome.			
51. Aktuglu K, Erol K, Vahabi A.	Ilizarov bone transport and treatment	Background: Critical-	Review	YES	NO
JI. AKTUGIU K, ETOLK, VAHADI A.	of critical-sized tibial bone defects: a		Keview	1123	
		sized bone defects of			
	narrative review. J Orthop Traumatol.	the tibia are complex			
	2019 Apr 16;20(1):22. doi:	injuries associated with			
	10.1186/s10195-019-0527-1. PMID:	significant problems			
	30993461; PMCID: PMC6468024.	that are difficult to			
		treat, and they are			
		associated with a			
		significant burden of			
		disease in clinical			
		practice; however, the			
		treatment of these cases			
		has still been a			
		challenge for			
		orthopedic surgeons.			
		The aim of this review			
		was to evaluate the			
		current available studies			
		reporting on classical			
		Ilizarov methods in the			
		treatment of infected or			
		noninfected critical-			
		sized bone defects of			
		the tibia, and to			
		perform an analysis of			
		treatment period and			
		complications.			
		=			
		Methods: This is a			
		narrative review based			
		on a comprehensive			
		literature search among			
		the studies in Pubmed,			
		Scopus and Web of			
		Science articles. The			
		studies included were			
		written in the English			
Ì		language or translated			
		to English and they			

were published
between 2008 and
2018. They were
appraised with narrative
data synthesis. The
primary outcome
measures were the
external fixation time
(EFT), bone union rate,
and bone and
functional results.
Secondary outcomes
were complications
including docking site
problems and
solutions. The
heterogeneity of the
data in the studies
which were taken into
consideration allowed a
narrative analysis.
Results: Twenty-seven
articles with 619
patients were included
in this study. These
included 6 prospective
and 21 retrospective
case series. Mean age
was 36.1 (range 13-89)
years. Of the cases,
88.8% were infected
and the remaining
11.2% were
noninfected. The
external fixation time
was 10.75 (range 2.5-
23.2) months. The
mean bone union rate
was 90.2% (range 77-
100)%. Radiographic
outcome measures
were reported in 20
studies. Functional
outcome measures
were reported in 18
studies. ASAMI
(Association for the
Study of the Method of
Ilizarov) criteria are
useful and give
reproducible data on
patient outcome
measurements. Data
collected from these
studies showed
excellent radiological
outcomes in 303, good
in 143, fair in 31, and
 <u></u>

		poor in 25 patients.			
		Functional outcomes			
		were excellent in 200,			
		good in 167, fair in 58,			
		and poor in 19, where			
		reported. The excellent			
		and good rate in bone			
		results and functional			
		results were 88.8% and			
		82.6%, respectively.			
		The poor rate in bone			
		results and functional			
		results were 5% and			
		4.5%. Mean			
		complication rate per			
		patient was 1.22 (range			
		3-60). The most			
		common complication		1	
		was pin tract infection		1	
		(PTI). Its occurrence		1	1
		was 46.6%. Joint			
		stiffness followed PTI			1
		with a 25% incidence.			
		The rates of refracture,			
		malunion, infectious			
		recurrence, and			
		amputation, were 4%,			
		8.4%, 4.58%, and 1%,			
		respectively.			
		Conclusions: This			
		narrative review shows			
		that the patients with			
		infected or noninfected			
		critical-sized tibial bone			
		defects treated by			
		Ilizarov methods had a			
		low rate of poor bone			
		and functional results.			
		Therefore, Ilizarov		1	
		methods may be a good		1	
		choice for the		1	
		treatment of infected or			
				1	
		noninfected tibial bone		1	1
		defects. The small		1	1
		number of cases in		1	1
		some studies, the		1	1
		absence of homogenity		1	1
		between studies and the		1	1
		fact that most data		1	1
		available are derived		1	1
		from retrospective		1	
		studies are some of the		1	
		difficulties encountered		1	
				1	
		in the evaluation of		1	
		evidence.	- ·		
52. Kapur B, Paniker J, Casaletto	An Alternative Technique for External	Background: Intra-	Review	YES	NO
J.	Fixation of Traumatic Intra-articular	articular fractures of the			1
	Fractures of Proximal and Middle	proximal		1	

Phalanx. Tech Hand Up Extrem Surg. interphalangeal (PIP) Dec;19(4):163-7. joint are commonly 10.1097/BTH.00000000000000102. treated with dynamic PMID: 26492600. external fixation. Most commonly used is the Suzuki modification of the pins and rubber traction system (PRTS). There are a few other modifications of the PRTS external fixators. present We alternative pin external fixator that is simple and effective. Methods: Under suitable anesthesia and image intensification a true lateral view of the head of the proximal phalanx is obtained. A K-wire construct holds the affected digit out to length with the fracture reduced and Jurgan pinballs hold the construct into position. Under image intensification the whole device is checked to ensure the joint and fracture is reduced and the joint is not over distracted. The PIP joint is also checked to ensure good range of motion. The device was checked in clinic at 1 week with radiographs. The wires are removed at 4 weeks followed by intensive hand physiotherapy. Results: Over patients with intraarticular fractures of the proximal and middle phalangeal were treated with this technique. In all cases the fracture healed with good joint congruency. patients achieved good range of motion of the

PIP joint but with some

degrees). There was no

of

(mean,

full

20

restriction

flexion

			ı	ı	1
		loss of position or pin-			
		site infections. There			
		was good compliance			
		with the treatment.			
		Discussion: The main			
		advantages of the			
		technique we describe			
		are: (1) the compact			
		design, making it less			
		cumbersome for the			
		patient compared with			
		other PRTS external			
		fixators; (2) it is			
		straightforward to			
		assemble and the device			
		is easy to adjust in clinic			
		if there is any loss of			
		reduction; (3) the pin-			
		balls prevent sharp			
		ends of the wire			
		protruding causing			
		morbidity to the			
		patient; (4) there is less			
		chance of loss of			
		traction compared with			
		traction devices using			
		rubber bands. It is a			
		dynamic device, which			
		Lallows mobilization of			
		allows mobilization of the joints reducing			
		the joints reducing			
53. Hardeski D. Gaski G. Joshi	Can applied external fixators be	the joints reducing stiffness.	Clinical	YES	NO
53. Hardeski D, Gaski G, Joshi M Venezia R Nascone IW	Can applied external fixators be sterilized for surgery? A prospective	the joints reducing stiffness. Background:	Clinical Trial	YES	NO
M, Venezia R, Nascone JW,	sterilized for surgery? A prospective	the joints reducing stiffness. Background: Temporary external	Clinical Trial	YES	NO
	sterilized for surgery? A prospective cohort study of orthopaedic trauma	the joints reducing stiffness. Background: Temporary external fixators are often used		YES	NO
M, Venezia R, Nascone JW,	sterilized for surgery? A prospective cohort study of orthopaedic trauma patients. Injury. 2016	the joints reducing stiffness. Background: Temporary external fixators are often used to stabilize fractures		YES	NO
M, Venezia R, Nascone JW,	sterilized for surgery? A prospective cohort study of orthopaedic trauma patients. Injury. 2016 Dec;47(12):2679-2682. doi:	the joints reducing stiffness. Background: Temporary external fixators are often used to stabilize fractures when definitive fracture		YES	NO
M, Venezia R, Nascone JW,	sterilized for surgery? A prospective cohort study of orthopaedic trauma patients. Injury. 2016 Dec;47(12):2679-2682. doi: 10.1016/j.injury.2016.07.009. Epub	the joints reducing stiffness. Background: Temporary external fixators are often used to stabilize fractures when definitive fracture surgery must be		YES	NO
M, Venezia R, Nascone JW,	sterilized for surgery? A prospective cohort study of orthopaedic trauma patients. Injury. 2016 Dec;47(12):2679-2682. doi:	the joints reducing stiffness. Background: Temporary external fixators are often used to stabilize fractures when definitive fracture surgery must be delayed. Sometimes,		YES	NO
M, Venezia R, Nascone JW,	sterilized for surgery? A prospective cohort study of orthopaedic trauma patients. Injury. 2016 Dec;47(12):2679-2682. doi: 10.1016/j.injury.2016.07.009. Epub	the joints reducing stiffness. Background: Temporary external fixators are often used to stabilize fractures when definitive fracture surgery must be delayed. Sometimes, external fixators are left		YES	NO
M, Venezia R, Nascone JW,	sterilized for surgery? A prospective cohort study of orthopaedic trauma patients. Injury. 2016 Dec;47(12):2679-2682. doi: 10.1016/j.injury.2016.07.009. Epub	the joints reducing stiffness. Background: Temporary external fixators are often used to stabilize fractures when definitive fracture surgery must be delayed. Sometimes, external fixators are left in place during repeat		YES	NO
M, Venezia R, Nascone JW,	sterilized for surgery? A prospective cohort study of orthopaedic trauma patients. Injury. 2016 Dec;47(12):2679-2682. doi: 10.1016/j.injury.2016.07.009. Epub	the joints reducing stiffness. Background: Temporary external fixators are often used to stabilize fractures when definitive fracture surgery must be delayed. Sometimes, external fixators are left in place during repeat operations, including		YES	NO
M, Venezia R, Nascone JW,	sterilized for surgery? A prospective cohort study of orthopaedic trauma patients. Injury. 2016 Dec;47(12):2679-2682. doi: 10.1016/j.injury.2016.07.009. Epub	the joints reducing stiffness. Background: Temporary external fixators are often used to stabilize fractures when definitive fracture surgery must be delayed. Sometimes, external fixators are left in place during repeat operations, including definitive internal		YES	NO
M, Venezia R, Nascone JW,	sterilized for surgery? A prospective cohort study of orthopaedic trauma patients. Injury. 2016 Dec;47(12):2679-2682. doi: 10.1016/j.injury.2016.07.009. Epub	the joints reducing stiffness. Background: Temporary external fixators are often used to stabilize fractures when definitive fracture surgery must be delayed. Sometimes, external fixators are left in place during repeat operations, including definitive internal fixation of tibial pilon		YES	NO
M, Venezia R, Nascone JW,	sterilized for surgery? A prospective cohort study of orthopaedic trauma patients. Injury. 2016 Dec;47(12):2679-2682. doi: 10.1016/j.injury.2016.07.009. Epub	the joints reducing stiffness. Background: Temporary external fixators are often used to stabilize fractures when definitive fracture surgery must be delayed. Sometimes, external fixators are left in place during repeat operations, including definitive internal fixation of tibial pilon and tibial plateau		YES	NO
M, Venezia R, Nascone JW,	sterilized for surgery? A prospective cohort study of orthopaedic trauma patients. Injury. 2016 Dec;47(12):2679-2682. doi: 10.1016/j.injury.2016.07.009. Epub	the joints reducing stiffness. Background: Temporary external fixators are often used to stabilize fractures when definitive fracture surgery must be delayed. Sometimes, external fixators are left in place during repeat operations, including definitive internal fixation of tibial pilon and tibial plateau fractures. It is unknown		YES	NO
M, Venezia R, Nascone JW,	sterilized for surgery? A prospective cohort study of orthopaedic trauma patients. Injury. 2016 Dec;47(12):2679-2682. doi: 10.1016/j.injury.2016.07.009. Epub	the joints reducing stiffness. Background: Temporary external fixators are often used to stabilize fractures when definitive fracture surgery must be delayed. Sometimes, external fixators are left in place during repeat operations, including definitive internal fixation of tibial pilon and tibial plateau fractures. It is unknown how well current		YES	NO
M, Venezia R, Nascone JW,	sterilized for surgery? A prospective cohort study of orthopaedic trauma patients. Injury. 2016 Dec;47(12):2679-2682. doi: 10.1016/j.injury.2016.07.009. Epub	the joints reducing stiffness. Background: Temporary external fixators are often used to stabilize fractures when definitive fracture surgery must be delayed. Sometimes, external fixators are left in place during repeat operations, including definitive internal fixation of tibial pilon and tibial plateau fractures. It is unknown how well current surgical preparation		YES	NO
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M, Venezia R, Nascone JW,	sterilized for surgery? A prospective cohort study of orthopaedic trauma patients. Injury. 2016 Dec;47(12):2679-2682. doi: 10.1016/j.injury.2016.07.009. Epub	the joints reducing stiffness. Background: Temporary external fixators are often used to stabilize fractures when definitive fracture surgery must be delayed. Sometimes, external fixators are left in place during repeat operations, including definitive internal fixation of tibial plateau fractures. It is unknown how well current surgical preparation sterilizes these devices, which become part of the surgical field. Our		YES	NO
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M, Venezia R, Nascone JW,	sterilized for surgery? A prospective cohort study of orthopaedic trauma patients. Injury. 2016 Dec;47(12):2679-2682. doi: 10.1016/j.injury.2016.07.009. Epub	the joints reducing stiffness. Background: Temporary external fixators are often used to stabilize fractures when definitive fracture surgery must be delayed. Sometimes, external fixators are left in place during repeat operations, including definitive internal fixation of tibial pilon and tibial plateau fractures. It is unknown how well current surgical preparation sterilizes these devices, which become part of the surgical field. Our hypothesis was that our institution's standard surgical preparation creates a low rate of		YES	NO

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Clinicians were blinded to study results until
to study results until
study completion.
Results: Two of 165
cultures (1.2%; 95%
confidence interval
[CI]: 0-2.9%) were
positive for common
pathogens sometimes
observed in surgical site
infection. Four cultures
(2.4%; 95% CI: 0-4.8%)

		had pathogens that are			
		rarely associated with			
		surgical site infection,			
		and four (2.4%; 95%			
		CI: 0-4.8%) had			
		nonpathogenic			
		organisms.			
		Conclusion: Using 70%			
		alcohol on external			
		fixators plus either			
		ChloraPrep for closed			
		wounds or povidone			
		iodine for open wounds			
		seems to result in a low			
		rate of positive cultures.			
		Most species that were			
		isolated are infrequently			
		identified as sources of			
		surgical site infections.			
		This preparation			
		protocol might be			
		effective at producing a			
		relatively clean			
		environment at the time			
		of surgery for patients			
		with external fixators			
		already in place.			
54. Chung KC, Malay S, Shauver	WRIST Group. Assessment of Distal	Importance:	RCT	YES	NO
MJ, Kim HM;	Radius Fracture Complications	Complications affect	11.01	1120	- 10
11-2), 1 2111 1 1212,	Among Adults 60 Years or Older: A	treatment outcomes			
	Secondary Analysis of the WRIST	and quality of life in			
	Randomized Clinical Trial. JAMA	addition to increasing			
	Netw Open. 2019 Jan 4;2(1):e187053.	treatment costs.			
	doi:	creatization costs.			
	10.1001/jamanetworkopen.2018.7053.	Objectives: To evaluate			
	PMID: 30657531; PMCID:	complication rates after			
	PMC6484535.	the treatment of a distal			
	111100101333.	radius fracture, to			
		determine whether the			
		rate or complication			
		type is associated with			
		treatment method, and			
		to determine predictors			
		of complications.			
		or complications.			
		Design, setting, and			
		participants: The			
		multicenter Wrist and			
		Radius Injury Surgical			
		Trial (WRIST), a			
		randomized clinical			
		trial, enrolled			
	j				
1		porticipante trom /			
		participants from April			
		10, 2012, to December			
		10, 2012, to December 31, 2016. The study			
		10, 2012, to December 31, 2016. The study included 304 adults 60			
		10, 2012, to December 31, 2016. The study			

radius fractures; 187 were randomized and 117 opted for casting. The study was conducted at 24 health systems in the United States, Canada, and Singapore. Data for this secondary analysis were collected from April 24, 2012, to February 28, 2018. Interventions: Participants opting for surgery were randomized to receive	
were randomized and 117 opted for casting. The study was conducted at 24 health systems in the United States, Canada, and Singapore. Data for this secondary analysis were collected from April 24, 2012, to February 28, 2018. Interventions: Participants opting for surgery were	
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Interventions: Participants opting for surgery were	
Participants opting for surgery were	
surgery were	
surgery were	
randomized to receive	
Tandonized to receive	
the volar locking plate	
system (n = 65),	
percutaneous pinning	
(n = 58), or bridging	
external fixation with or	
without supplemental	
$\begin{array}{cccc} pinning & (n) & = & 64). \end{array}$	
Patients who chose not	
to have surgery (n =	
117) were not	
randomized and were	
enrolled for casting.	
Main outcomes and	
measures:	
Complication rate.	
Results: The WRIST	
enrolled a total of 304	
participants, of whom 8	
casting group	
participants were later	
found to be ineligible	
and were excluded	
from the analysis,	
leaving 296	
participants.	
Randomized	
participants' mean (SD)	
age was 68 (7.2) years,	
163 (87%) were female,	
and 165 (88%) were	
white. Casting	
participants' mean (SD)	
age was 75.6 (9.6) years,	
93 (84%) were female,	
and 85 (85%) were	
white. The most	
common type of	
complications varied by	
treatment. Twelve of 65	
participants (18.5%) in	

	the internal fixation			
	group reported a			
	median nerve			
	compression, while 16			
	of 26 participants			
	(25.8%) who received			
	external fixation and 13			
	of 56 participants			
	(23.2%) who received			
	pinning sustained pin			
	site infections.			
	Compared with the			
	internal fixation group,			
	complication rate for			
	any severity			
	complication was			
	higher in participants			
	who initially received			
	casting (adjusted rate			
	ratio, 1.88; 95% CI,			
	1.22-2.88), whereas the			
	rate for moderate			
	complications was			
	higher in the external			
	fixation group (adjusted			
	rate ratio, 2.52; 95% CI,			
	1.25-5.09).			
	Conclusions and			
	relevance: The distal			
	radius fracture			
	treatment decision-			
	making process for			
	older patients should			
	incorporate a			
	complication profile for			
	each treatment type.			
	For example, external			
	fixation and pinning			
	could be used for			
	patients after apprising			
	them of pin site			
	infection risk. Internal			
	fixation can be done in			
	patients with high			
	functional demands			
	who are willing to			
	receive surgery. Internal			
	fixation use should be			
	substantiated owing to			
1	the time and cost			
	1 1 1			
	involved.	C	XZEC	N T C
55. Muir RL, Forrester R, Fine Wire Circular Fixation for	Intra-articular calcaneal	Systematic	YES	NO
Sharma H. Displaced Intra-Articular Calcanea	Intra-articular calcaneal fractures represent an	Systematic Review	YES	NO
Sharma H. Displaced Intra-Articular Calcanea Fractures: A Systematic Review. J Foo	Intra-articular calcaneal fractures represent an ongoing challenge for		YES	NO
Sharma H. Displaced Intra-Articular Calcanea Fractures: A Systematic Review. J Foo Ankle Surg. 2019 Jul;58(4):755-761	Intra-articular calcaneal fractures represent an ongoing challenge for the orthopedic		YES	NO
Sharma H. Displaced Intra-Articular Calcanea Fractures: A Systematic Review. J Foo Ankle Surg. 2019 Jul;58(4):755-761 doi: 10.1053/j.jfas.2018.11.030. Epub	Intra-articular calcaneal fractures represent an ongoing challenge for the orthopedic community, with the		YES	NO
Sharma H. Displaced Intra-Articular Calcanea Fractures: A Systematic Review. J Foo Ankle Surg. 2019 Jul;58(4):755-761	Intra-articular calcaneal fractures represent an ongoing challenge for the orthopedic community, with the benefits of the previous		YES	NO
Sharma H. Displaced Intra-Articular Calcanea Fractures: A Systematic Review. J Foo Ankle Surg. 2019 Jul;58(4):755-761 doi: 10.1053/j.jfas.2018.11.030. Epub	Intra-articular calcaneal fractures represent an ongoing challenge for the orthopedic community, with the		YES	NO

reduction and internal fastion having been calcided into question in several and into question in several large transformed controlled trials. Fine wire circular fastion may expresent a sacral alternative transfer to the property of the p		
reduction and internal fixation having been called into question in several large randomized controlled trials. Fine wire circular fixation may represent a useful alternative treatment for these injuries, combining minimally invasive application with rigid fixation, which allows the possibility of early weight bearing. We performed a systematic review of published studies that used circular fixation for calculated fractures and recorded functional outcomes at follow up. In a total of 11 studies why 255 calculated finitures for which there was follow-up, our inclusion criteria were met 8.2% of fractures were open fractures, and 12% of patients, and 12% of patients which may be a finite finiture for patients with multiple orthopodic finitures. Finitures for fractures were open fractures, and 12% of patients which multiple orthopodic finitures or studies of a variety of tools across the different studies, but outcomes compared favorably with those seen with open reduction and internal fixation. Although pin site infections were common (22.0%), serious complications, including deep infection (16%), and complex regional pain syndrome. (0.8%), would infection (16%), and complex regional pain syndrome. (0.8%), were exceedingly rate. The results suggest that this is a viable alternative treatment for calculated.		treatment of open
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	quality randomized			
	controlled trials are			
	required before the			
	technique can enter			
	mainstream use.			
56. Ferchaud F, Rony L, Reconstruction of large diaphyseal		Clinical	YES	NO
Ducellier F, Cronier P, bone defect by simplified bone		trial	120	
Steiger V, Hubert L; transport over nail technique: A 7-case		CII		
Orthopedics and series. Orthop Traumatol Surg Res.				
Traumatology Society of 2017 Nov;103(7):1131-1136. doi:	-			
Western France (SOO). 10.1016/j.otsr.2017.05.016. Epub	=			
2017 Jun 20. PMID: 28645704.	technique of segmental			
2017 Juli 2011 111120 200 1070 11	bone transport by			
	monorail external			
	fixator over an			
	intramedullary nail.A			
	prospective study			
	included 7 patients: 2			
	femoral and 5 tibial			
	defects. Mean age was			
	31 years (range: 16-			
	61years). Mean follow-			
	up was 62 months			
	(range: 46-84months).			
	Defects were post-			
	traumatic, with a mean			
	length of 7.2cm (range:			
	4 to 9.5cm). For 3			
	patients, reconstruction			
	followed primary			
	failure. In 4 cases, a			
	covering flap was			
	necessary. Transport			
	used an external fixator			
	guided by an			
	intramedullary nail, at a			
	rate of 1mm per day.			
	One pin was implanted			
	on either side of the			
	distraction zone. The			
	external fixator was			
	removed 1 month after			
	bone contact at the			
	docking site. Mean			
	bone transport time			
	was 11 weeks (range: 7-			
	15 weeks). Mean			
	external fixation time			
	was 5.1months (range:			
	3.5 to 8months). Full			
	weight-bearing was			
	allowed 5.7months			
	(range: 3.5-13months)			
	after initiation of			
	transport. In one			
	patient, a pin had to be			
	repositioned. In 3			
	patients, the			
	transported segment re-			

		ascended after external			
		fixatorablation,			
		requiring repeat			
		external fixation and			
		resumption of			
		transport. There was			
		just 1 case of superficial			
		, -			
		Reconstruction quality			
		was considered			
		"excellent" on the			
		Paley-Marr criteria in 6			
		cases. The present			
		technique provided			
		excellent			
		reconstruction quality			
		in 6 of the 7 cases.			
		External fixation time			
		was shorter and			
		resumption of weight-			
		bearing earlier than			
		with other			
		reconstruction			
		techniques, notably			
		including bone			
		autograft, vascularized			
		bone graft or the			
		induced membrane			
		technique. Nailing			
		facilitated control of			
		limb axis and length.			
		The complications rate			
		was 50%, comparable			
		to other techniques.			
		This study raises the			
		question of systematic			
		internal fixation of the			
		docking site, to avoid			
		any mobilization of the			
		transported segment.			
		The bone quality, axial			
		control and rapidity			
		shown by the present			
		technique make it well-			
		adapted to			
		reconstruction of			
		diaphyseal bone defect.			
57. Mikamo H, Yamagishi Y,	Efficacy, safety, and immunogenicity	Background: The	Clinical	YES	NO
Murata S, Yokokawa R, Han	of a quadrivalent HPV vaccine in	quadrivalent (q) human	Trial	10	
SR, Wakana A, Sawata M,	Japanese men: A randomized, Phase 3,	papillomavirus (HPV)	1 1141		
Tanaka Y.	placebo-controlled study. Vaccine.	vaccine protects against			
Taliana T.		infection and disease			
	2019 Mar 14;37(12):1651-1658. doi:				
	10.1016/j.vaccine.2019.01.069. Epub	related to HPV types 6,			
	2019 Feb 20. PMID: 30797638.	11, 16, and 18. We			
		report efficacy,			
		immunogenicity, and			
		safety of qHPV vaccine			
		in a Phase 3 study in			
		in a Phase 3 study in Japanese men.			

Methods: In this
randomized, double-
blind trial
(NCT01862874),
Japanese men (aged 16- 26 years) were
26 years) were randomized in a 1:1
ratio to receive three
doses of qHPV vaccine
or placebo (Day 1,
Month 2, Month 6).
The primary efficacy
endpoint was the
combined incidence of
HPV6/11/16/18-
related persistent
anogenital infection
$ \begin{array}{ccc} \text{(detected} & \text{at} & \geq 2\\ \text{consecutive visits} & \geq 6 \end{array} $
months apart), assessed
in the per-protocol
population of men who
received all three
vaccinations, and were
seronegative at Day 1
and PCR negative from
Day 1 to Month 7 to the
relevant HPV type.
Results are from the
interim and final
analyses.
Results: In total, 1124
participants were
randomized. The
vaccine demonstrated
83.3% (95% confidence
interval: 24.9, 98.2; p =
0.007) and 85.9% (95%
confidence interval:
52.7, 97.3; p < 0.001)
efficacy against
HPV6/11/16/18- related persistent
infection in the interim
and final analyses,
respectively. Two cases
of HPV6/11/16/18-
related external genital
lesions (condyloma and
PIN 1) were observed
in the placebo group
and none in the qHPV
vaccine group at study
end. At Month 7, >97%
of participants who
received qHPV vaccine seroconverted to each
SCIOCOHVEHEU to cach

		of the vaccine HPV	-		
		types. Most participants			
		remained seropositive			
		at Month 36, although			
		the seropositivity rate			
		declined between			
		Months 7 and 36.			
		Vaccination-related			
		adverse events were			
		reported in 60.8% and			
		56.5% of participants in			
		the qHPV vaccine and			
		placebo groups,			
		respectively; most			
		commonly mild to			
		moderate injection-site			
		pain, erythema, and			
		swelling. Injection-site			
		pain and swelling were			
		more common with			
		qHPV vaccine than			
		placebo (each $p < 0.05$).			
		Conclusions: Results			
		suggest qHPV vaccine			
		is efficacious against			
		HPV6/11/16/18-			
		related persistent			
		infections,			
		immunogenic, and			
		well-tolerated in			
		Japanese men. Clinical			
		trial registration			
		identifier:			
		NCT01862874.			
58. Chounta V, Overton ET,	Patient-Reported Outcomes Through	Background: Advances	RCT	YES	NO
	1 Year of an HIV-1 Clinical Trial		KC1	1E3	NO
Mills A, Swindells S, Benn		in HIV-1 therapeutics			
PD, Vanveggel S, van		have led to the			
Solingen-Ristea R, Wang Y,	1	development of a range			
Hudson KJ, Shaefer MS,		of daily oral treatment			
Margolis DA, Smith KY,	2021 Nov;14(6):849-862. doi:	regimens, which share			
Spreen WR.	10.1007/s40271-021-00524-0. Epub	similar high efficacy			
	2021 May 31. PMID: 34056699;	rates. Consequently,			
	PMCID: PMC8563641.	more emphasis is being			
		placed upon the			
		individual's experience			
		of treatment and			
		impact on quality of			
		life. The first long-			
		acting injectable			
		antiretroviral therapy			
		for HIV-1 (long-acting			
		cabotegravir +			
		rilpivirine [CAB + RPV			
		rilpivirine [CAB + RPV LA]) may address			
		rilpivirine [CAB + RPV LA]) may address challenges associated			
		rilpivirine [CAB + RPV LA]) may address challenges associated with oral treatment for			
		rilpivirine [CAB + RPV LA]) may address challenges associated			

drug-food interactions, and adherence. Patient-reported outcomes (PROs) collected in an HIV-1 clinical trial (ATLAS-2M; NCT03299049) comparing participants' experience with two dosing regimens (every 4 weeks [Q4W] vs. every 4 weeks [Q4W] vs. every 6 weeks [Q8W]) of CAB + RPV LA are presented herein. Methods: PRO endpoints evaluated through 48 weeks of therapy included treatment satisfaction (HIV Treatment Satisfaction (HIV Treatment Satisfaction (HIVTSQI), treatment acceptance ("General Acceptance" domain of the Chronic Treatment Acceptance [ACCEPT®] questionnaire, acceptability of	
and adherence. Patient- reported outcomes (PROs) collected in an HIV-1 clinical trial (ATLAS-2M; NCT0329049) comparing participants' experience with two dosing regimens (every 4 weeks [Q4W] vs. every 8 weeks [Q5W]) of CAB + RPV LA are presented herein. Methods: PRO endpoints evaluated through 48 weeks of therapy included treatment satisfaction (HIV Treatment Satisfaction Questionnaire [HIVTSQ]), treatment acceptance "General Acceptance" (General Acceptance" (General Acceptance (HCD) (HC	
reported outcomes (PROs) collected in an HIV-1 clinical trial (ATLAS-2M; NCT03299049) comparing participants' experience with two dosing regimens (every 4 weeks [Q4W] vs. every 8 weeks [Q4W] vs. every 8 weeks [Q4W] of CAB + RPV LA are presented herein. Methods: PRO endpoints evaluated through 48 weeks of therapy included treatment satisfaction (HIV Treatment Satisfaction Questionnaire [HIVTSQ]), treatment acceptance ("General Acceptance" (Gomain of the Chronic Treatment Acceptance [ACCEPT®] questionnaire),	
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treatment satisfaction (HIV Treatment Satisfaction Questionnaire [HIVTSQ]), treatment acceptance ("General Acceptance" domain of the Chronic Treatment Acceptance [ACCEPT®] questionnaire),	
(HIV Treatment Satisfaction Questionnaire [HIVTSQ]), treatment acceptance ("General Acceptance" domain of the Chronic Treatment Acceptance [ACCEPT®] questionnaire),	
Satisfaction Questionnaire [HIVTSQ]), treatment acceptance ("General Acceptance" domain of the Chronic Treatment Acceptance [ACCEPT®] questionnaire),	
Questionnaire [HIVTSQ]), treatment acceptance ("General Acceptance" domain of the Chronic Treatment Acceptance [ACCEPT®] questionnaire),	
[HIVTSQ]), treatment acceptance ("General Acceptance" domain of the Chronic Treatment Acceptance [ACCEPT®] questionnaire),	
acceptance ("General Acceptance" domain of the Chronic Treatment Acceptance [ACCEPT®] questionnaire),	
Acceptance" domain of the Chronic Treatment Acceptance [ACCEPT®] questionnaire),	
the Chronic Treatment Acceptance [ACCEPT®] questionnaire),	
Acceptance [ACCEPT®] questionnaire),	
[ACCEPT®] questionnaire),	
[ACCEPT®] questionnaire),	
questionnaire),	
injections (Perception	
of Injection [PIN]	
questionnaire),	
treatment preference	
(questionnaire), and	
reasons for switching	
to/continuing long-	
acting therapy	
(exploratory endpoint;	
questionnaire).	
Participants were	
randomized 1:1 to	
receive CAB + RPV	
LA Q8W or Q4W.	
Results were stratified	
by prior CAB + RPV	
exposure in either	
preplanned or post hoc	
analyses.	
Results: Overall, 1045	
participants were	
randomized to the	
Q8W (n = 522) and	
$\boxed{Q4W (n = 523)}$	
regimens; 37% (n =	
391/1045) had	
previously received	
provident to the second	

CAB + RPV in ALIAS. For participants without prior CAB + RIV exposure, large increases from bascine were reported in treatment satisfaction in both long-acting control in the control in		
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59. Xu J, Sun X, Xin Q, Cheng Y, Zhan Z, Zhang J, Wu J.	Effect of immunonutrition on colorectal cancer patients undergoing surgery: a meta-analysis. Int J Colorectal Dis. 2018 Mar;33(3):273-283. doi: 10.1007/s00384-017-2958-6. Epub 2018 Jan 15. PMID: 29335838; PMCID: PMC5816768.	1 = totally acceptable]: Q8W 1.72; Q4W 1.59) at baseline/Week 8 that were maintained over time. Participants without prior CAB + RPV exposure who received Q8W dosing preferred this regimen over oral CAB + RPV (98%, n = 300/306). Among those with prior Q4W exposure, 94% (n = 179/191) preferred Q8W dosing versus Q4W dosing (3%, n = 6/191) or oral CAB + RPV (2%, n = 4/191). Conclusions: Both long-acting regimens provided high treatment satisfaction and acceptance, irrespective of prior CAB + RPV exposure, with most participants preferring Q8W dosing over both the Q4W regimen and their previous daily oral regimen. The PRO data collected at Week 48 support the therapeutic potential of CAB + RPV LA. Purpose: Immunonutrition has been used to prevent the complications after colorectal elective surgery. This systematic review aimed to analyze and assess the effect of immunonutrition on colorectal cancer patients who received elective surgery. Methods: Three	Meta- Analysis	YES	NO
		colorectal cancer patients who received elective surgery.			

standard mutition (EN) or parenteral immunonotation (PIN) compared with standard parenteral nutrition (PN) on colorectal cancer patients who are undergoing surgery under the color of the		
parenteral immunountrion (PIN) compared with standard parenteral nutrition (PN) on colorectal camer parients who are undengoing surgery until 21st of April, 2017. Meta-analysis was conducted to calculate odd risk (OR), mean difference (MID), or standard mean difference (MID), or standard difference (AID), or standard difference (AID), or standard and heterospensity was tested by Q test. Results Nine publications were included. The meta- analysis results presented that EIN improved the length of hospital stay (pooled MD, 253, 95% CI, 129-3.41), infectious complications (pooled OR, 0.33, 95% CI, 0.21- 0.53) which contains the Surgical Sire Infectious (pooled OR, 0.25, 95% CI, 0.22- 0.56) Superficial/Deep incisional infectious (pooled OR, 0.27, 95% CI, 0.12-0.61); meanwhile, PIN improved the length of hospital stay (pooled MD, 2-66, 95% CI, 0.12-0.63); fooled OR, 0.27, 95% CI, 0.12-0.61; meanwhile, PIN improved the length of hospital stay (pooled MD, 2-66, 95% CI, 0.02-4.76), IIA (pooled MD, 2-66, 95% CI, 0.02-4.76), IIA (pooled MD, 5-69, 95% CI, 0.22-4.76), IIA (pooled MD, 5-69, 95% CI, 0.22-4.76), IIA (pooled MD, 5-79, 95% CI, 0.23-4.78); the level of CID8 was lower (pooled MD, 0.50; 95% CI, 0.22-4.78); the level of CID8 was lower (pooled MD, 0.50; 95% CI, 0.22-4.78); the level of CID8 was lower (pooled MD, 0.50; 95% CI, 0.22-4.78); the level of CID8 was lower (pooled MD, 0.50; 95% CI, 0.22-4.78); the level of CID8 was lower (pooled MD, -4.32; 95% CI, -		standard enteral
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2017. Meta-analysis was conducted to calculate odd risk (OR), mean difference (MD), or standard mean difference (SMD) with 95% confidence interval (CI), and heterogeneity was tested by Q test. Results: Nine publications were included. The meta-analysis results presented that EIN improved the length of hospital stay (pooled MD, 2.53; 95% CI, 1.29-3.41), infectious complications (pooled OR, 0.33, 95% CI, 0.21-0.53) which contains the Surgical Site Infectious (pooled OR, 0.32, 95% CI, 0.22-0.55) and Superficial/Deep incisional infections (pooled OR, 0.22; 95% CI, 0.22-0.55) Superficial/Deep incisional infections (pooled OR, 0.27; 95% CI, 0.12-0.64); meanwhile, PIN improved the length of hospital stay (pooled MD, 2.66; 95% CI, 10.11 to -2.07), CD3 (pooled MD, 2.66; 95% CI, 10.11 to -2.07), CD3 (pooled MD, 5.07; 95% CI, 10.12-0.07), CD4 (pooled MD, 5.07; 95% CI, 10.17, 5.17; 95% CI, 2.54-840), and CD4/CD8 (pooled MD, 5.07; 95% CI, 0.30; 95% CI, 95		
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60. Hamdy RC, Montpetit K, Aiona MD, MacKenzie WG, van Bosse HJ, Narayanan U, Raney EM, Chafetz RS, Thomas SE, Weir S, Gregory S, Yorgova P, Takahashi S, Rinaldi M, Zhang X, Dahan-Oliel N. Safety and Effica Toxin A in Chi Lower Limb Deformity Correc Double-blind, Randomized Corpediatr Orthop. 20 doi: 10.1097/BPO.0000 PMID: 25730290.	diren Undergoing Lengthening of the lower limb is a complex procedure in which pain management and complications such as pin-site infections and muscle contractures	NO

χ tests were used to
compare potential
differences across both
groups.
Results: Mean age of
the 125 participants was
12.5 years (range, 5 to
21 y), and lengthenings
averaged 4.2 cm.
Maximum pain scores
on day 1
postoperatively were
lower in the BTX-A
group (P=0.03) than in
the placebo group, and
remained significant
favoring botox when
stratifying by location
of lengthening (femur
benefits for BTX-A
were found for 3 quality
of life domains at mid-
distraction and end-
distraction. When
stratifying according to
location of lengthening,
there were significantly
fewer pin-site
infections in the tibia
favoring botox
(P=0.03). The amount
of adverse events and
bone healing indices
were no different in
both groups.
Conclusions: The
clinical differences in
quality of life, the lower
pain on the first
postoperative day, and
the lower number of
pin-site infections in
the tibia favoring BTX-
A support its use as an
adjunctive treatment to
the lengthening
process. The detailed
analyses of pain
patterns help inform
families on the pain
expectations during
lower limb
lengthenings. The
amount of adverse
events were no
different in both

		groups, and bone healing rates were similar, indicating that the use of BTX-A in children undergoing limb lengthening and deformity correction is			
61. Krappinger D, Zegg M, Smekal V, Huber B. Die Korrektur posttraumatischer	Deformitäten am Unterschenkel mit dem "Taylor Spatial Frame" [Correction of posttraumatic lower leg deformities using the Taylor Spatial Frame]. Oper Orthop Traumatol. 2014 Oet;26(5):520-31. German. doi: 10.1007/s00064-013-0233-8. PMID: 23801041.	safe. Objective: Correction of posttraumatic lower leg deformities using percutaneous osteotomy, external fixation with a ring fixator, and computerassisted gradual correction with the Taylor Spatial Frame (TSF).	Clinical Trial	YES	10
		Posttraumatic lower leg deformities not suitable for acute correction and internal fixation or deformities that are suitable but have a significantly increased risk for complications: deformities with poor soft tissue coverage, rigid deformities that require gradual correction, complex			
		mulitplanar deformities, deformities with shortening, and periarticular juvenile deformities. Contraindications: Posttraumatic lower leg deformities which are suitable for acute correction and internal			
		fixation are also suitable for deformity correction using the TSF. In these cases, however, we recommend acute correction and internal fixation in order to improve the patient comfort. Lack of patient compliance for self-contained correction and pin care.			

Surgical technique:
Percutaneous fixation
of the TSF rings to the
main fragments using
transosseous K-wires
and half pins (hybrid
fixation). Percutaneous
ostcotomy of the tibia
either by drilling across
both cortices and
completion of the
osteotomy using an
osteotome (DeBastiani
method) or by using the
Gigli saw with
preservation of the
periostal envelope.
Connection of both
rings with six oblique
telescopie struts via
universal joints (hovepad platform)
(hexapod platform).
Computer-assisted
planning of the correction.
correction.
Postoperative
management: Gradual
postoperative
correction of the
deformity by changing
the strut lengths
according to the
correction plan. Strut
changes, if required.
Osseous consolidation
of the osteotomy site
with the TSF or
revision to internal
fixation.
Results: The correction
of posttraumatic lower
leg deformities using
the TSF was performed
in 6 cases. The mean
deformity was 15° (12-
22°) in the frontal plane
and 6° (4-8°) in the
sagittal plane. The
correction time was 19
days (14-22 days). The
deviation between
planned and achieved
correction was 0-3° in
the frontal plane and 0-
2° in the sagittal plane.
The osseous

		consolidation of the			
		osteotomy site was			
		carried out in the TSF			
		in 5 cases with a mean			
		external fixation time of			
		112 days (94-134 days).			
		In one case, the TSF			
		was removed after the			
		correction and the			
		osteotomy site was			
		fixed using an			
		intramedullary nail. Pin			
		site infections were			
		observed in 3 cases. There were no further			
		1			
		treatment goal was achieved in all cases.			
		The examination at			
		final follow-up was			
		performed after 1 year.			
		All patients were able to			
		walk without walking			
		aids and with no pain at			
		that time. They were			
		able to perform all of			
		their activities of the			
		daily life and their			
		leisure activities			
		without limitations.			
62. Farrow L, Ablett AD, Mills L,	Early versus delayed surgery for	Aims: We set out to	Meta-	YES	NO
Barker S.	paediatric supracondylar humeral	determine if there is a	Analysis		
	fractures in the absence of vascular	difference in			
	compromise: a systematic review and	perioperative outcomes			
	meta-analysis. Bone Joint J. 2018	between early and			
	Dec;100-B(12):1535-1541. doi:	delayed surgery in			
	10.1302/0301-620X.100B12.BJJ-	paediatric			
	2018-0982.R1. PMID: 30499316.	supracondylar humeral			
		fractures in the absence of vascular			
		compromise through a			
		systematic review and			
		meta-analysis.			
		111Cta-a11a1y 515.			
		Materials and methods:			
		A literature search was			
		performed, with search			
		1,			
ı		outputs screened for			
		outputs screened for studies meeting the			
		outputs screened for studies meeting the inclusion criteria. The			
		studies meeting the			
		studies meeting the inclusion criteria. The			
		studies meeting the inclusion criteria. The groups of early surgery (ES) and delayed surgery (DS) were			
		studies meeting the inclusion criteria. The groups of early surgery (ES) and delayed surgery (DS) were classified by study			
		studies meeting the inclusion criteria. The groups of early surgery (ES) and delayed surgery (DS) were classified by study authors. The primary			
		studies meeting the inclusion criteria. The groups of early surgery (ES) and delayed surgery (DS) were classified by study authors. The primary outcome measure was			
		studies meeting the inclusion criteria. The groups of early surgery (ES) and delayed surgery (DS) were classified by study authors. The primary outcome measure was open reduction			
		studies meeting the inclusion criteria. The groups of early surgery (ES) and delayed surgery (DS) were classified by study authors. The primary outcome measure was			

in the presence of
sufficient study
homogeneity.
Individual study risk of
bias was assessed using
the Risk of Bias in Non-
Randomised Studies -
of Interventions
(ROBINS-I) criteria,
with the Grading of
Recommendations,
Assessment,
Development and
Evaluations (GRADE)
criteria used to evaluate
outcomes
independently.
Results: A total of 12
studies met the
inclusion criteria (1735
fractures). Pooled mean
time to surgery from
injury was and 10.7
hours for ES and 91.8
hours for DS. On meta-
analysis there was no
significant difference
between ES versus DS
for the outcome of
requirement. There was
also no significant
difference for the
outcomes: Iatrogenic
nerve injury, pin site
infection, and re-
operation. The quality
of evidence for all the
individual outcomes
was low or very low.
Conclusions: There is
no evidence that
delaying supracondylar
fracture surgery
negatively influences
outcomes in the
absence of vascular
compromise. There are,
however, notable
limitations to the
existing available
literature.
Keywords: Delay;
Distal humerus; Elbow;
Gartland;
Orthopaedics;

		Paediatrics;			
		Supracondylar;			
		Systematic review;			
		Timing; Trauma.			
63. Bousquet J, Schunemann HJ,	MACVIA-ARIA Sentinel Network	Several unmet needs	Review	YES	NO
Fonseca J, Samolinski B,	for allergic rhinitis (MASK-rhinitis):	have been identified in	review	113	
Bachert C, Canonica GW,	the new generation guideline	allergie rhinitis:			
Casale T, Cruz AA, Demoly	implementation. Allergy. 2015	identification of the			
P, Hellings P, Valiulis A,	Nov;70(11):1372-92. doi:	time of onset of the			
Wickman M, Zuberbier T,	10.1111/all.12686. Epub 2015 Sep 13.	pollen season, optimal			
Bosnic-Anticevitch S,	PMID: 26148220.	control of rhinitis and			
Bedbrook A, Bergmann KC,		comorbidities, patient			
Caimmi D, Dahl R, Fokkens		stratification,			
WJ, Grisle I, Lodrup Carlsen		multidisciplinary team			
K, Mullol J, Muraro A,		for integrated care			
Palkonen S, Papadopoulos		pathways, innovation in			
N, Passalacqua G, Ryan D,		clinical trials and, above			
Valovirta E, Yorgancioglu A,		all, patient			
Aberer W, Agache I, Adachi		empowerment. MASK-			
M, Akdis CA, Akdis M,		rhinitis (MACVIA-			
Annesi-Maesano I,		ARIA Sentinel			
Ansotegui IJ, Anto JM,		Network for allergic			
Arnavielhe S, Arshad H,		rhinitis) is a simple			
Baiardini I, Baigenzhin AK,		system centred around			
Barbara C, Bateman ED,		the patient which was			
Beghé B, Bel EH, Ben		devised to fill many of			
Kheder A, Bennoor KS,		these gaps using			
Benson M, Bewick M, Bieber		Information and			
T, Bindslev-Jensen C,		Communications			
Bjermer L, Blain H, Boner					
AL, Boulet LP, Bonini M,		Technology (ICT) tools			
Bonini S, Bosse I, Bourret R,		support system (CDSS)			
Bousquet PJ, Braido F,		based on the most			
Briggs AH, Brightling CE,		widely used guideline in			
Brozek J, Buhl R, Burney PG,		allergic rhinitis and its			
Bush A, Caballero-Fonseca		asthma comorbidity			
F, Calderon MA, Camargos		(ARIA 2015 revision).			
PA, Camuzat T, Carlsen KH,		It is one of the			
Carr W, Cepeda Sarabia AM,		implementation			
Chavannes NH, Chatzi L,		systems of Action Plan			
Chen YZ, Chiron R,		B3 of the European			
Chkhartishvili E, Chuchalin		Innovation Partnership			
AG, Ciprandi G, Cirule I,		on Active and Healthy			
Correia de Sousa J, Cox L,		Ageing (EIP on AHA).			
Crooks G, Costa DJ,		Three tools are used for			
Custovic A, Dahlen SE,		the electronic			
Darsow U, De Carlo G, De		monitoring of allergic			
Blay F, Dedeu T, Deleanu D,		diseases: a cell phone-			
Denburg JA, Devillier P,		based daily visual			
Didier A, Dinh-Xuan AT,		analogue scale (VAS)			
Dokic D, Douagui H, Dray		assessment of disease			
G, Dubakiene R, Durham		control, CARAT			
SR, Dykewicz MS, El-Gamal		(Control of Allergic			
Y, Emuzyte R, Fink Wagner		Rhinitis and Asthma			
A, Fletcher M, Fiocehi A,		Test) and e-Allergy			
Forastiere F, Gamkrelidze A,		screening (premedical			
		system of early			
Genicioğlu B, Gereda JE,		diagnosis of allergy and			
González Diaz S, Gotua M, Grouse L, Guzmán MA,					
Giouse L, Guzman IMA,		asthma based on online	<u> </u>	<u> </u>	

Haahtela T, Hellquist-Dahl		tools). These tools are		
B, Heinrich J, Horak F,		combined with a		
Hourihane JO, Howarth P,		clinical decision		
Humbert M, Hyland ME,		support system (CDSS)		
Ivancevich JC, Jares EJ,		and are available in		
Johnston SL, Joos G, Jonquet		many languages. An e-		
O, Jung KS, Just J, Kaidashev		CRF and an e-learning		
I, Kalayei O, Kalyoneu AF,		tool complete MASK.		
Keil T, Keith PK, Khaltaev		MASK is flexible and		
N, Klimek L, Koffi N'Goran		other tools can be		
B, Kolek V, Koppelman GH,		added. It appears to be		
Kowalski ML, Kull I, Kuna		an advanced, global and		
P, Kvedariene V, Lambrecht		integrated ICT answer		
B, Lau S, Larenas-Linnemann		for many unmet needs		
D, Laune D, Le LT,		in allergic diseases		
Lieberman P, Lipworth B, Li		which will improve		
J, Louis R, Magard Y,		policies and standards.		
Magnan A, Mahboub B,		policies and standards.		
Majer I, Makela MJ, Manning		Keywords: ARIA;		
P, De Manuel Keenoy E,		Information and		
Marshall GD, Masjedi MR,		communications		
Maurer M, Mavale-Manuel S,		technology; MACVIA-		
Melén E, Melo-Gomes E,		LR; allergic rhinitis;		
Meltzer EO, Merk H,		asthma.		
Miculinic N, Mihaltan F,		astiniia.		
Milenkovic B, Mohammad Y,				
Molimard M, Momas I,				
Montilla-Santana A, Morais-				
Almeida M, Mösges R,				
Namazova-Baranova L,				
Naclerio R, Neou A, Neffen				
H, Nekam K, Niggemann B,				
Nyembue TD, O'Hehir RE,				
Ohta K, Okamoto Y, Okubo				
K, Ouedraogo S, Paggiaro P,				
Pali-Schöll I, Palmer S,				
Panzner P, Papi A, Park HS,				
Pavord I, Pawankar R, Pfaar				
O, Picard R, Pigearias B, Pin				
I, Plavec D, Pohl W, Popov				
TA, Portejoie F, Postma D,				
Potter P, Price D, Rabe KF,				
Raciborski F, Radier Pontal				
F, Repka-Ramirez S, Robalo-				
Cordeiro C, Rolland C,				
Rosado-Pinto J, Reitamo S,				
Rodenas F, Roman				
Rodriguez M, Romano A,				
Rosario N, Rosenwasser L,				
Rottem M, Sanchez-Borges				
M, Scadding GK, Serrano E,				
Schmid-Grendelmeier P,				
Sheikh A, Simons FE, Sisul				
JC, Skrindo I, Smit HA, Solé				
D, Sooronbaev T, Spranger				
O, Stelmach R, Strandberg T,				
Sunyer J, Thijs C, Todo-Bom				
A, Triggiani M, Valenta R,				
Valero AL, van Hage M,				
, , , , , , , , , , , , , , , , , , , ,	1		l l	

Vandenplas O, Vezzani G,					
Vichyanond P, Viegi G,					
Wagenmann M, Walker S,					
Wang DY, Wahn U, Williams					
DM, Wright J, Yawn BP,					
Yiallouros PK, Yusuf OM,					
Zar HJ, Zernotti ME, Zhang					
L, Zhong N, Zidarn M,					
Mercier J.					
64. Schottel PC, Smith CS, Helfet DL.	Symptomatic hip impingement due to exostosis associated with supraacetabular pelvic external fixator pin. Am J Orthop (Belle Mead NJ). 2014 Jan;43(1):33-6. PMID: 24490184.	Expedient stabilization of unstable pelvic fractures has been shown to significantly reduce morbidity and mortality in the polytrauma patient. Application of a pelvic external fixator is one of the methods used to provide effective pelvic stability. However, pelvic external fixators are not without drawbacks. While pin tract infections and pin loosening are frequent complications, we describe a unique complication consisting of the formation of a symptomatic exostosis at the supra-acetabular pin site in a 35-year-old male with a pelvic fracture. To our knowledge this is the first description of hip impingement due to reactive bone formation secondary to	Review	YES	NO
		a supra-acetabular pelvic external fixation pin. The impinging bone was completely excised utilizing the anterior approach to the hip. A 40°			
		improvement in the patient's hip flexion range of motion was noted after exostosis excision.			
65. Fadel M, Ahmed MA, Al-	Hizarov external fixation versus plate	Purpose: The purpose	RCT	YES	NO NO
Dars AM, Maabed MA,		of this study was to			
Shawki H.	extra-articular fractures of the distal	evaluate the outcome of			
	tibia. Int Orthop. 2015 Mar;39(3):513-	Hizarov external			
	9. doi: 10.1007/s00264-014-2607-4.	fixation (IE) versus			
	Epub 2014 Dec 5. PMID: 25472753.	dynamic compression			
	2014 Dec 3. 1 Milb. 23472733.				
1		plate (PO) in the	Ì	1	

management of extra-
articular distal tibial
fractures.
Tractares.
Methods: Between
2010 and 2011, extra
articular distal tibial
fractures in 40
consecutive patients
met the inclusion
criteria. They were
classified according to
AO classification
fraction to A (A1 A2)
fracture type A (A1, A2,
and A3). In a
randomized method,
two equal groups were
managed using either
IE or PO. PO was
performed using open
reduction and internal
fixation (ORIF) and
DCP through
anterolateral approach.
IE was done using
Hizarov frame. For the
PO group, non-weight
bearing ambulation was
permitted on the
second postoperative
day but partial weight
bearing was permitted
according to the
progression in union
criteria clinically and
radiologically. For the
HE group, weight
bearing started as
tolerated from the first
postoperative day.
Physiotherapy and pin-
site care was performed
by the patient
themselves.
Results: Modified
Mazur ankle score was
applied to IE (excellent
10, good 10) and in PO
(excellent 2, good 8,
poor 6). Data were
statically analysed using
(Mann-Whitney test).
The rate of healing in
the IE group (average
130) was higher than
the PO (average 196.5);
plus, there were no
cases of delayed union
cases of delayed union

		or nonunion in the IE			
		group (p value 0.003).			
		group (p value 0.003).			
		Conclusion: It was			
		found that IE			
		compared with PO			
		provides provision of			
		immediate weight			
		bearing as tolerated			
		following postoperative			
		recovery, irrespective			
		of radiological or			
		clinical healing with no			
		infection, deformity or			
		non-union.			
66. Ramos T, Eriksson BI,	Ilizarov external fixation or locked	Purpose: The aim of	RCT	YES	NO
Karlsson J, Nistor L.	intramedullary nailing in diaphyseal	this study was to			
	tibial fractures: a randomized,	compare the Ilizarov			
	prospective study of 58 consecutive	circular fixator (IL) and			
	patients. Arch Orthop Trauma Surg.	locked intramedullary			
	2014 Jun;134(6):793-802. doi:	nailing (IM).			
	10.1007/s00402-014-1970-3. Epub	D			
	2014 Mar 25. PMID: 24664228.	Patients and methods:			
		Patients with isolated			
		tibia shaft fractures			
		were randomly			
		allocated to either the			
		IL $(n = 31)$ or IM $(n =$			
		27) method.			
		Conventional			
		radiographs,			
		postoperative pain			
		assessment, self-			
		appraisal scores and			
		complications were			
		evaluated. At the			
		clinical 1-year follow-			
		up, the patients were			
		also evaluated by an			
		independent observer.			
		Results: The minority			
		of patients had open			
		fractures, two and nine			
		patients in the IM and			
		IL groups, respectively.			
		Eight patients in the IM			
		group and four in the			
		IL group sustained			
		major complications (p			
		= 0.107). In the IM			
		group, two patients			
		developed			
		compartment			
		syndrome, one deep			
		infection, one hardware			
		failure, one delayed			
		union, one			
		pseudarthrosis and two			
				ii	

		had a malunion. In the			
	!	IL group, two patients			
	!	developed			
	!	pseudarthrosis and two			
	!	had a malunion.			
	!	Superficial pin-site			
	!	infections were			
	!	observed in 16 patients			
	!				
	!	in the IL group. The			
	!	fractures had healed			
	!	radiographically at 12			
		weeks in both groups.			
	!	At the 1-year follow-up,			
	!	there were differences			
		in pain (VAS) and			
		satisfaction (VAS)			
		scores in favor of IL			
		treatment (VAS, $p =$			
		0.03 and $p = 0.02$,			
		respectively). There			
		were no differences			
		between the groups			
		with regard to range of			1
	!	motion (ROM) in the			
	!	knee and ankle joints.			
	!	The registration of local			
	!	tenderness and pain			
	!	revealed that there were			
	!	19 patients with			
	!	anterior knee pain in			
	!	the IM group and one			
	!	in the IL group at the 1-			
	!				
	!	year follow-up (p <			
	!	0.001).			
	!				
	!	Conclusion: The IL is a			
	!	safe and reliable			
	!	alternative to IM for the			
		treatment of tibial shaft			1
		fractures, with a low			1
		complication rate and			1
		good clinical outcome.			
		Both treatments were			
		well tolerated, but at the			
		1-year follow-up the			
		patients in the IM			
		group had more pain			
		and were less satisfied.			
		Finally, there was a high			
		frequency of anterior			
		knee pain in the IM			
		group.			1
67. Su YC, Guo YH, Hsieh PC,	Efficacy and safety of botulinum toxin	Background: To	Meta-	YES	NO
Lin YC.	type A in distraction osteogenesis of	explore the efficacy and	Analysis	110	
IAII I C.	the lower extremities: a meta-analysis	safety of botulinum	2 111a1 y 515		1
	of randomized controlled trials. BMC				1
		toxin in patients who			1
	Musculoskelet Disord. 2022 Mar	received distraction			1
	25;23(1):286. doi: 10.1186/s12891-	osteogenesis of the			
		1			
		lower extremities.			

022-05175-2. PMID:	35337325;		
PMCID: PMC8953065.	,	Methods: We searched	
		the PubMed, Medline,	
		Cochrane Library, and	
		Web of Science	
		databases for	
		randomized controlled	
		trials that administered	
		botulinum toxin to	
		individuals who	
		underwent distraction	
		osteogenesis of the	
		lower limbs. The final	
		search was conducted	
		on July 6, 2021. Quality	
		assessments were	
		conducted using the	
		Cochrane risk of bias	
		tool and the Jadad scale.	
		We performed random-	
		effects meta-analysis to	
		calculate the	
		standardized mean	
		differences (SMDs) and	
		confidence intervals	
		(CIs) of the pooled	
		effect sizes, and	
		subgroup analysis and	
		meta-regression were	
		performed for potential	
		moderators.	
		moderators.	
		Results: Our analysis of	
		four randomized	
		controlled trials, which	
		enrolled a total of 257	
		participants, revealed	
		that the difference in	
		1 0	
		distraction phase was	
		not statistically	
		significant between	
		groups (SMD, - 0.165;	
		95% CI, - 0.379 to	
		0.050, p = 0.133 , I2 =	
		0.0%). The meta-	
		regression analyses did	
		not find any influence	
		on the effect size,	
		considering age ($\beta = -$	
		0.0092; p = 0.61) and	
		the amount of	
		lengthening $(\beta =$	
		0.0023; p = 0.99).	
		Subgroup analysis did	
		not reveal difference	
		between different doses	
		of botulinum toxin and	
		single or multi-site	

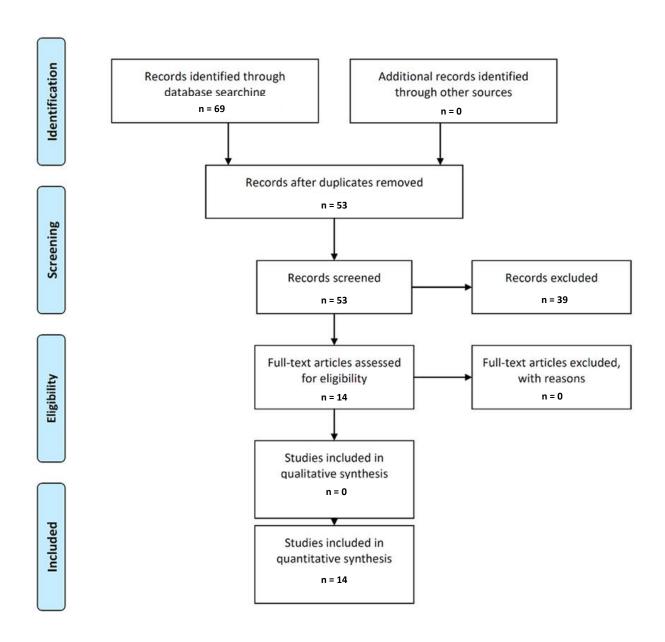
		study design. An			
		analysis of two			
		randomized controlled			
		trials enrolling a total of			
		177 individuals			
		demonstrated a limited			
		effect of botulinum			
		toxin in reducing			
		postoperative pain			
		(SMD, - 0.239; 95% CI,			
		-0.641 to 0.162, p =			
		0.24, $I2 = 37.6%$), total			
		adverse events (SMD, -			
		0.207; 95% CI, - 0.505			
		to 0.090, $p = 0.17$, $I2 =$			
		0.0%), and infection of			
		pin site (SMD, - 0.131;			
		95% CI, - 0.428 to			
		0.165, p = 0.39, I2 =			
		0.103, p = 0.39, 12 = 0.0%). No botulinum			
		toxin-related adverse			
		events were reported.			
		C 1 ' ''			
		Conclusions: The			
		current evidence does			
		not support the			
		administration of			
		botulinum toxin in			
		patients who receive			
		distraction osteogenesis			
		of the lower limbs.			
		However, we were			
		unable to draw decisive			
		conclusions because of			
		the limitations of our			
		meta-analysis. Future			
		well-designed, large-			
		scale randomized			
		controlled trials are			
		necessary to confirm			
		our conclusions.			
68. Wani N, Baba A, Kangoo K,	Role of early Ilizarov ring fixator in the	We evaluated the	Clinical	YES	NO
Mir M.	definitive management of type II, IIIA	results of patients with	Trial	1170	
17111 171.	and IIIB open tibial shaft fractures. Int		11141		
		Gustilo types II, IIIA and IIIB open tibial			
	Orthop. 2011 Jun;35(6):915-23. doi: 10.1007/s00264-010-1023-7. Epub				
	_ ·	fractures managed early			
	2010 May 6. PMID: 20445978;	with the Ilizarov			
	PMCID: PMC3103954.	external fixator (IEF).			
		Sixty patients (51 males,			
		nine females; age range			
		20-62 years; mean age			
		32.8 years) with type II			
		(11 patients), type IIIA			
		(13) and type IIIB (36)			
		tibial diaphyseal			
		fractures underwent			
		emergency			
		debridement and			
1					
		minimal bone fixation			

(with external fixator),
followed by definite
fixation with the IEF
after three to five days.
Average duration of the
hospital stay was 8.6
days. All fractures
united with an average
union time of 21.1
weeks (standard
deviation [SD] 3.18) in
type II, 21.7 weeks (SD
3.57) in IIIA and 24. 9
weeks (SD 5.14) in IIIB
fractures. The
difference between
union time in type II
and IIIA was not
significant (p > 0.05),
but that between IIIA
(and also type II) and
IIIB was significant (p
< 0.05). The healing
index in patients who
underwent lengthening
was 1.5 months/cm.
The wounds in 27
patients were managed
by delayed primary
closure, in 19 patients
with second intent (all
IIIB), in 11 patients
with skin grafting
(mostly type IIIB
fractures) and in three
patients with
musculocutaneous
flaps. The most
common complications
of the procedure were
pin tract infection and
pain at the fracture site.
Most of the patients
were able to achieve
good knee and ankle
range of motion. Early
application of the
Ilizarov fixator
constitutes an excellent
management of open
tibial fractures,
especially types II, IIIA
and IIIB, due to good
functional and
radiological results.
Despite the technical
difficulties and some
complications (which
are mostly minor) IEF

		may be the preferred			
		method in open tibial			
		fractures, especially			
		types II and III.			
69. Lohia LK, Meena S, Kanojia	Comparative study of complete	Background: Various	RCT	YES	NO
RK.	subtalar release and Joshi's external	procedures have been	KC1	11.5	
KIX.		used for the			
	management of neglected and resistant	management of			
	idiopathic clubfoot. Foot Ankle Surg.	neglected and resistant			
	2015 Mar;21(1):16-21. doi:	clubfoot. The aim of			
	10.1016/j.fas.2014.08.007. Epub 2014	our study was to assess			
	Aug 27. PMID: 25682401.	the clinical and			
		radiological correction			
		by Joshi's external			
		stabilization system			
		(JESS fixator) and			
		Simons subtalar release			
		in resistant and			
		neglected idiopathic			
		congenital talipes			
		equinovarus in children			
		between the ages of 1			
		and 2 years.			
		arra 2 years.			
		Methods: A total of 50			
		resistant and neglected			
		clubfeet were randomly			
		divided into two equal			
		groups of 25 feet each.			
		Group I was treated			
		with JESS fixator and			
		group II was treated			
		with complete subtalar			
		release as described by			
		Simons. Assessment of			
		correction achieved was			
		done both clinically and			
		radiologically.			
		Functional outcome			
		was assessed with			
		Ponseti scale.			
		Results: The change in			
		clinical deformity and			
		radiological correction			
		of deformity were			
		statistically significant			
		within each group, but			
		not significant when			
		compared to each			
		other. In group I			
		excellent results were			
		obtained in 17 (68%)			
		and good in 8 (32%) of			
		the feet. In group II,			
		excellent results were			
		found in 16 (64%) and			
		good in 9 (36%) feet			
		out of the 25 feet. Pin-			

<u> </u>	
	site infections were
	seen in two cases in
	group I and serious skin
	problems occurred in
	two feet in group II.
	Conclusion: We
	conclude that there
	were no statistical
	significant differences
	between the outcomes
	of the two techniques in
	this short-term follow-
	up of 2.4 years. Thus,
	functional distraction
	using JESS can be
	utilized as an alternative
	method in cases of
	neglected and resistant
	clubfoot.
i l	0.000000

Appendice B



[&]quot;To make this world a better place for patients and family who are fighting against chronic wounds"

CINV What's New?

"CINV What's New?" e' una mini rubrica che propone una lista di lavori di interesse vulnologico. I titoli presenti in essa sono stati scelti dal direttore clinico. I criteri di selezione danno preferenza a linee guida, RCTs, revisioni sistematiche, medical technology guidance. Sono stati scelti poiché si ritiene possano essere di interesse e utili a supportare le pratiche basate sulle evidenze scientifiche.

Buona lettura.

Si ringraziano i membri dell'Expert Panel per il supporto nella revisione degli articoli.

Massimo Rivolo.

- Prontosan for treating acute and chronic wounds Medical technologies guidance [MTG67] Published: 08 March 2022 LINK
- Effectiveness of a multi-layer silicone-adhesive polyurethane foam dressing as prevention for sacral pressure ulcers in at-risk in-patients: Randomized controlled trial. Key Primary Research 2022 LINK
- 3C Patch for treating diabetic foot ulcers. Evidence Based Synopsis 2022 LINK
- Comparing the standard surgical dressing with dehydrated amnion and plateletderived growth factor dressings in the healing rate of diabetic foot ulcer: A randomized clinical trial. Key primary research 2022 LINK
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