

# The Devil's in the detail: Illuminating the experience of pin site infection

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# Background

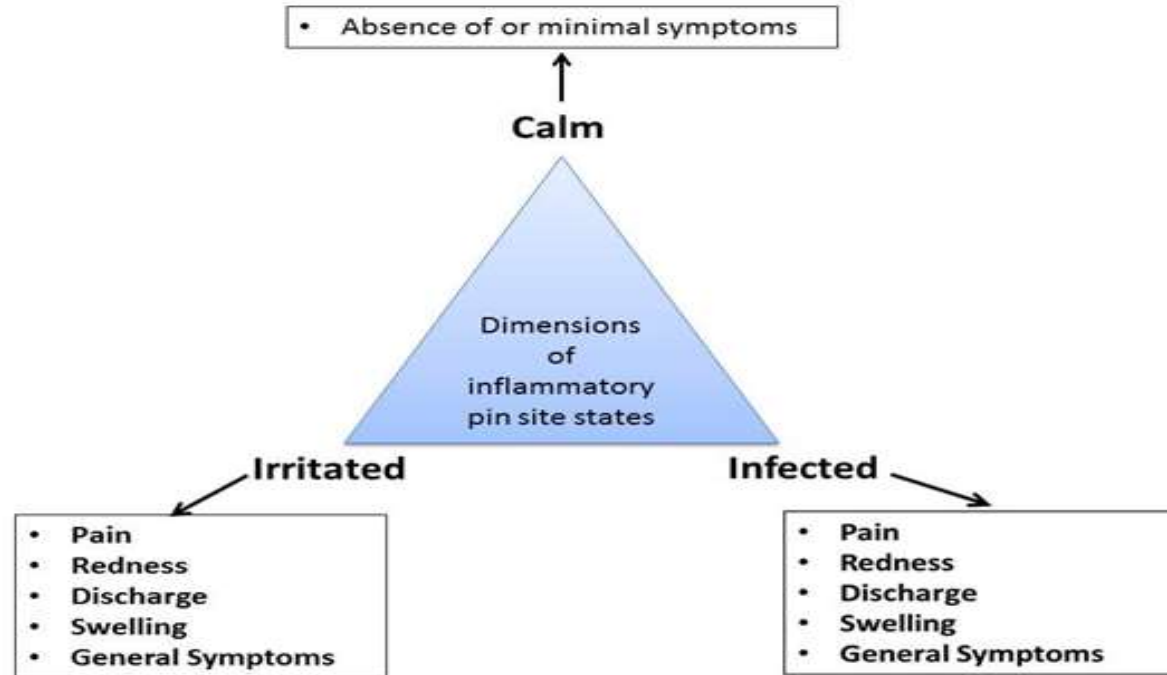
- Painful
- Threatens success of treatment
- Repeated infections
- Antibiotic resistance
- Costly
- Difficult to diagnose infection
- Current assessment criteria are not patient-centred
- No difference between infection and ‘reaction’



# Study 1 - Questions

- What makes patients suspect they have a pin site infection?
  - What are patients' experiences of the symptoms of suspected pin site infection?
  - How do patients differentiate between pin site infection and other wound states?
    - Grounded Theory study
    - n=16 patients who had experienced pin site infection
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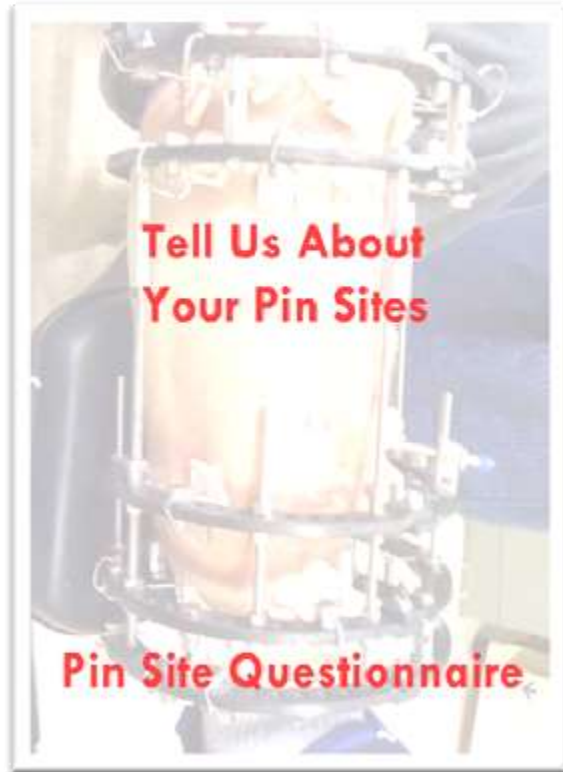
# Study 1 – results



## Study 2 – questions

- What is the frequency and severity of patient-reported symptoms of the pin site states, identified in the first phase of the study - ‘calm’, ‘irritated’ and ‘infected’?
  - Can patient responses relating to the presence of and different levels of symptoms discriminate between three patient-reported clinical states of pin sites: ‘calm’, ‘irritated’ and ‘infected’?
  - What is the underlying factor structure of the questionnaire?
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# Methods



Scale of 1-5  
Yes/No

- Pain
- Swelling
- Redness
- Discharge
- Weight-bearing
- Systemic symptoms

# Sample

n=165 Adults with lower limb external fixators

Hospital	n =	%
A	20	12.1
B	17	10.3
C	5	3.0
D	24	14.5
E	7	4.2
F	13	7.9
G	78	47.3
Missing	1	0.6
Total	165	99.9%

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## Findings 1 (One-way ANOVA and Cochran's Q)

- Redness, swelling, pain, discharge, heat & burning, shiny skin & smell were:
    - greatest in infected pin sites
    - less in irritated
    - not present at all or slight in calm
  - Redness, swelling and pain demonstrated the greatest variability in scores between the three states
  - Itchiness greater in irritated than infected
  - Difficulty or pain in using leg greatest with infection
  - Nausea & vomiting, feeling unwell, feeling feverish & shivering were largely features of infection
  - Disturbed sleep worst with infection but was still present with irritated & calm pin sites
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## Findings 2 (Principal components analysis)

- PCA factor analysis indicated the presence of two ‘components’ for both infection and irritation
  - Pain, redness, shiny skin and heat and burning were all features of the first component
    - Consistent with ‘classic’ inflammatory symptoms
  - Itchiness, dry flaky skin and smell were features of the second
    - Appear to some degree consistent with symptoms that relate to contact dermatitis
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# Dermatitis

- **Contact dermatitis** (also known as contact eczema) - an inflammatory skin reaction caused by response to an external agent that acts as either an irritant or an allergen
    - **Allergic contact dermatitis** - the result of a hypersensitivity reaction following sensitisation and subsequent re-exposure to an allergen
    - **Irritant contact dermatitis** is an inflammatory response that occurs after damage to the skin (Bourke, Coulson and English, 2009) from an external irritant
  - Acute symptoms of both irritant and allergic dermatitis are similar and include: **vesiculation** (blistering), **erythema**, **itching** (pruritus), **oedema** (swelling), papules (small solid elevation of the skin) and **exudation**
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# Possible irritants in external fixation

- The presence of metal in the tissue as a foreign body
  - The use of agents such as Chlorhexidine gluconate (cause of hypersensitivity), alcohol solutions and other substances in the process of wound cleansing
  - Difficulties for patients in carrying out normal care and the skin's inability to shed dead cells and maintain a healthy state
  - Metal allergy – sensitivity to nickel, cobalt, chromium common causes of allergic contact dermatitis
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# Implications for practice

- Infection should be diagnosed using patient reported signs and symptoms
- Patients need written and verbal information about what to look for
- Patient perceptions of the presence of infection should be taken seriously
- Dermatitis needs further consideration



# ‘RaPiDO’ - proposed Assessment Tool for Pin Site Infection and Irritation

	Redness	Pain	Discharge	Other
<b>Calm</b>	<ul style="list-style-type: none"> <li>• None or minimal</li> <li>• Looks like a ‘piercing’</li> </ul>	<ul style="list-style-type: none"> <li>• None or minimal</li> </ul>	<ul style="list-style-type: none"> <li>• None or minimal</li> <li>• Transparent/straw coloured ‘serous’ ooze</li> </ul>	<ul style="list-style-type: none"> <li>• No other symptoms</li> </ul>
<b>Irritated</b>	<ul style="list-style-type: none"> <li>• Moderate</li> <li>• Can be local or generalised</li> </ul>	<ul style="list-style-type: none"> <li>• Moderate</li> <li>• Doesn’t prevent weight bearing or use of the limb</li> </ul>	<ul style="list-style-type: none"> <li>• Moderate serous discharge</li> <li>• Requires more frequent dressing changes</li> </ul>	Any of the following: <ul style="list-style-type: none"> <li>• Itchiness</li> <li>• Severe dry skin</li> <li>• Scabbed skin</li> <li>• Blistering skin</li> </ul>
<b>Infected</b>	<ul style="list-style-type: none"> <li>• Extensive</li> <li>• Spreading</li> <li>• Feels hot</li> <li>• Looks ‘angry’</li> </ul>	<ul style="list-style-type: none"> <li>• Severe</li> <li>• Occurs at rest</li> <li>• Inability/difficulty bearing weight or using the limb</li> </ul>	<ul style="list-style-type: none"> <li>• Heavy discharge</li> <li>• Cloudy/coloured</li> <li>• May include frank pus</li> </ul>	<ul style="list-style-type: none"> <li>• Feeling generally unwell like beginning of a cold or ‘flu’</li> </ul>

Thank you

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