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# ‘The More the Merrier’ Near Complete Surgical Fixation of Chest Wall Injuries

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DR VIGNESH RATNARAJ MD

A/PROFESSOR PHILLIP ANTIPPA OAM MBBS MPH FRACS



Chest Wall  
Injury Society   
Amsterdam, Netherlands



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# Disclosures

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# Acknowledgements

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The Royal Melbourne Hospital

The Lung Cancer informatics database

The Trauma data base

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# Background

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Rib fractures are a common thoracic injury that is encountered in 20% to 39% of patients with blunt chest trauma and is associated with substantial morbidity and mortality.

Surgical stabilisation of rib fractures (SSRF) is becoming a widely supported procedure which provides real reduction in mortality and morbidity.

However long-term data and patient outcomes are still in their early stages with little guidance on the extent of ribs fractures that need to be stabilized.

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# Purpose

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The focus of this review is to evaluate the use of a single 3-dimensional prosthesis – its use, the percentage of fractures fixated and complications over a 13 year period of frequent and uninterrupted use.





# Methods

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We conducted a retrospective analysis of all patients undergoing SSRF at The Royal Melbourne Hospital (Level 1 Trauma Centre) between January 2010 to July 2022.

Data were collected from the medical records and statistically analysed with primary outcomes examined being extent and percentage of rib fractures being surgically stabilised and the correlating degree of device failure.

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# Results

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A total of 372 patients underwent SSRF over a 13-year period with a total use of 2056 plates. 96% of patients were treated for acute trauma.

Indications for SSRF included flail chest, displaced fractures, pain, and inability to wean from mechanical ventilation.





# Demographics

<b>Mechanism</b>	<b>n</b>
Assault	14
Crush	24
Cycle	36
Fall	78
Horse	14
MBA	57
MVA	88
Pedestrian	34
Skiing	7
Coughing	5
other	10
<b>Total</b>	<b>367</b>

<b>Gender</b>	<b>n</b>
Male	282
Female	85

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# Hospital Data

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<b>Pre-op</b>	<b>n</b>
IP (ICU Non-ventilated)	46
IP (ICU Ventilated)	136
IP (Ward)	174
Outpatient	11

Median length of stay 3 days

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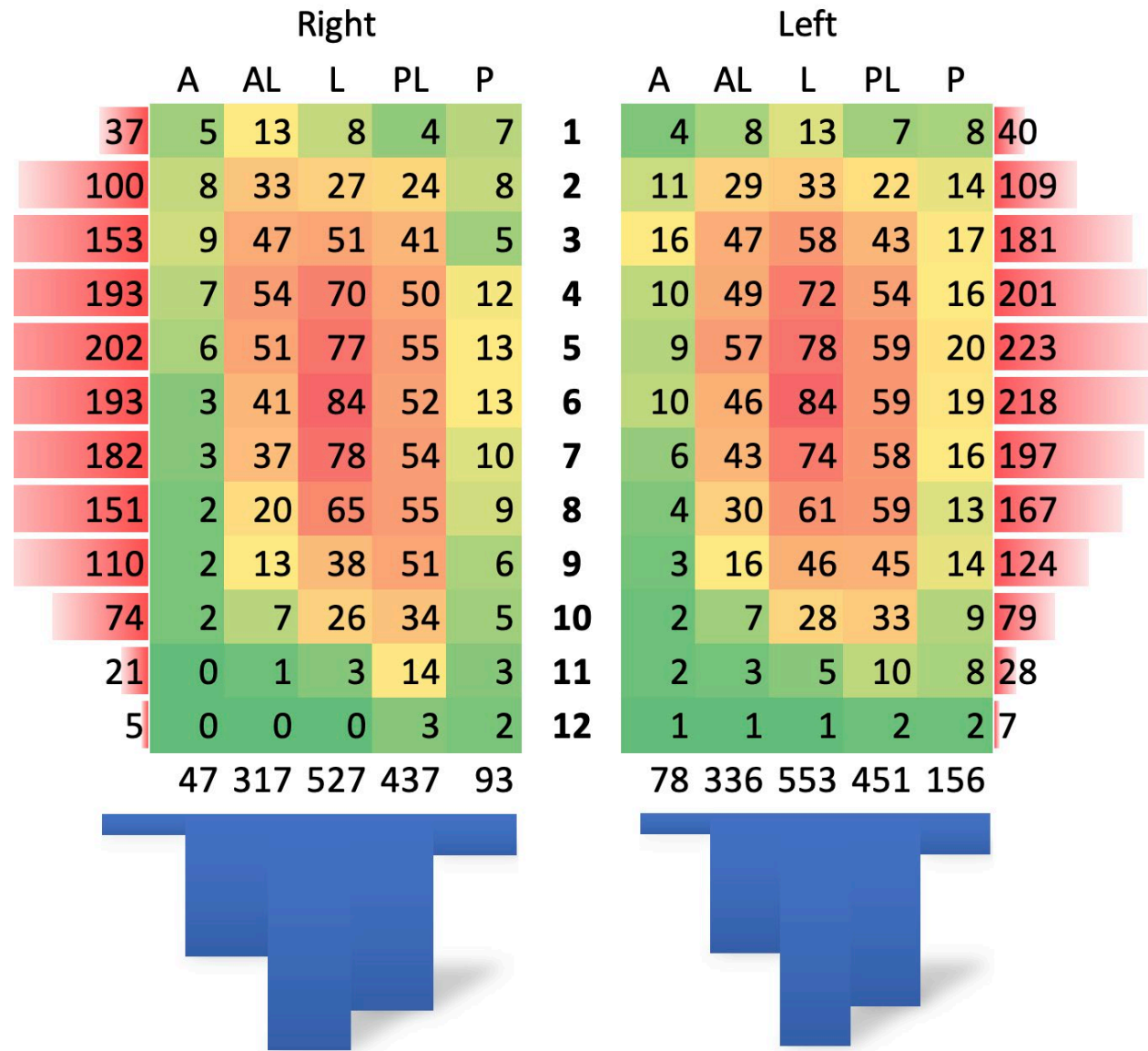
# Disposition

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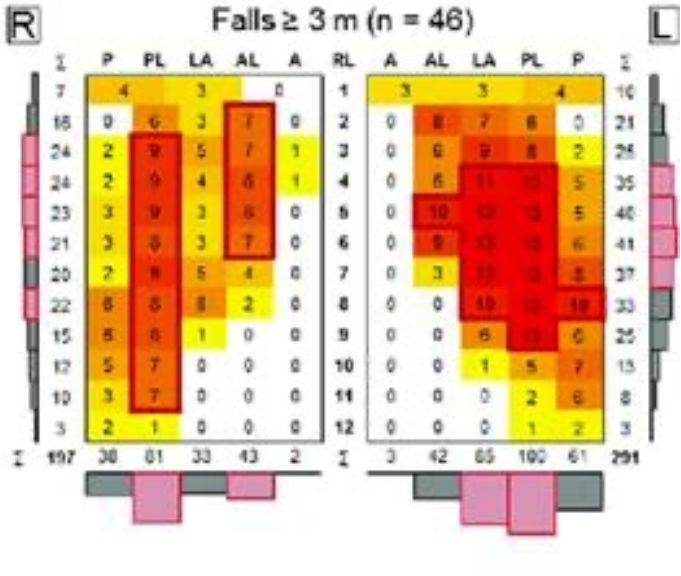
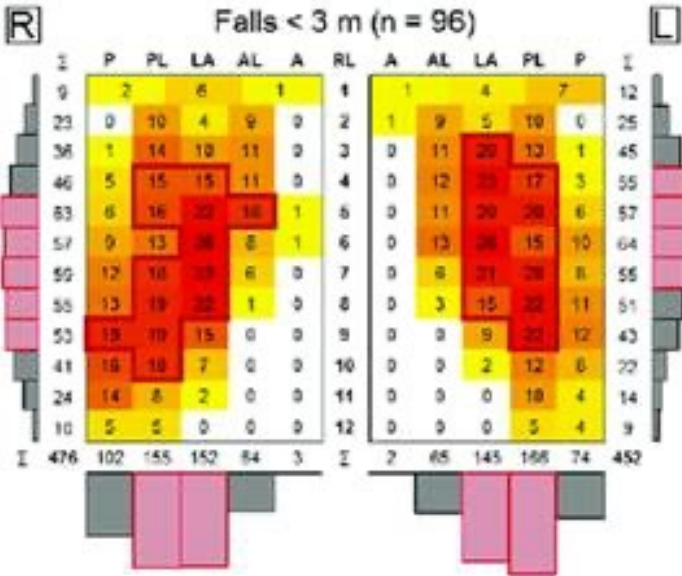
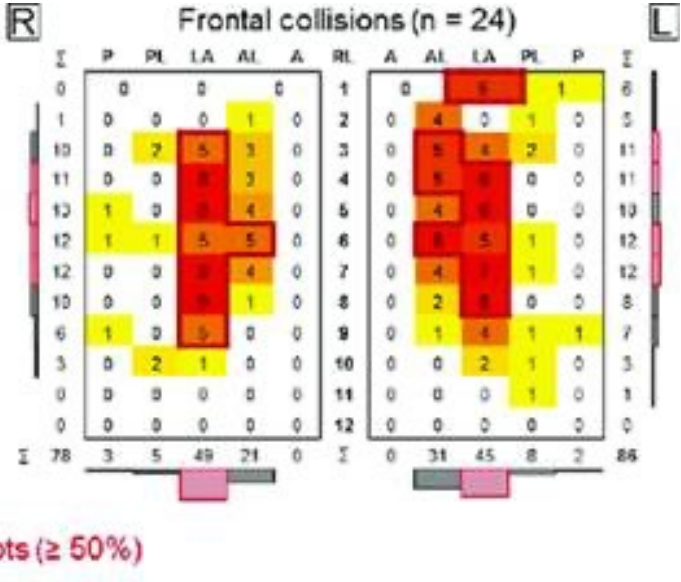
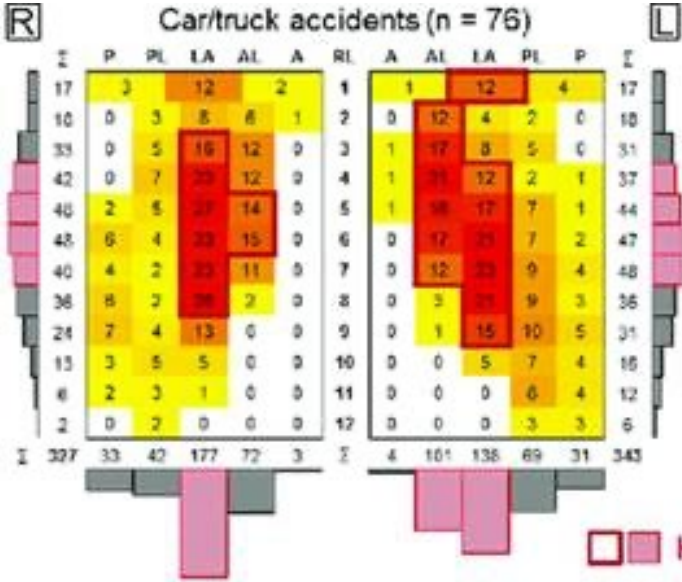
<b>Discharge location</b>	<b>n</b>
Home	241
Other (Hospital)	49
Rehab	73
Death	4



# Heat map of Rib Fractures

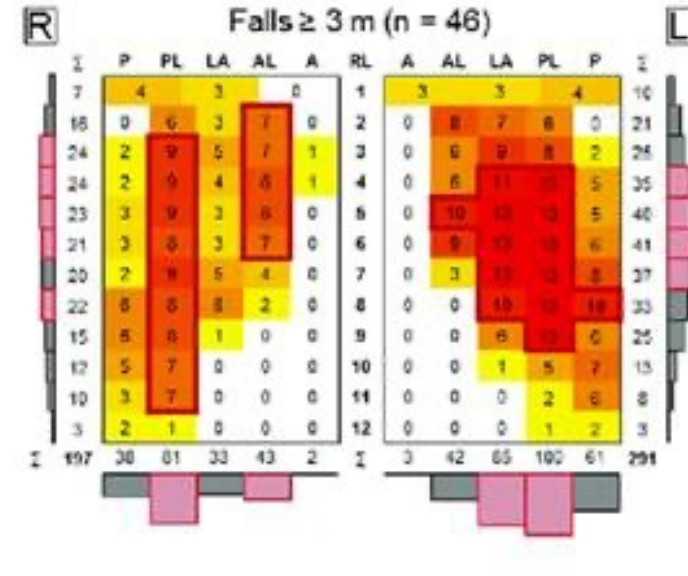
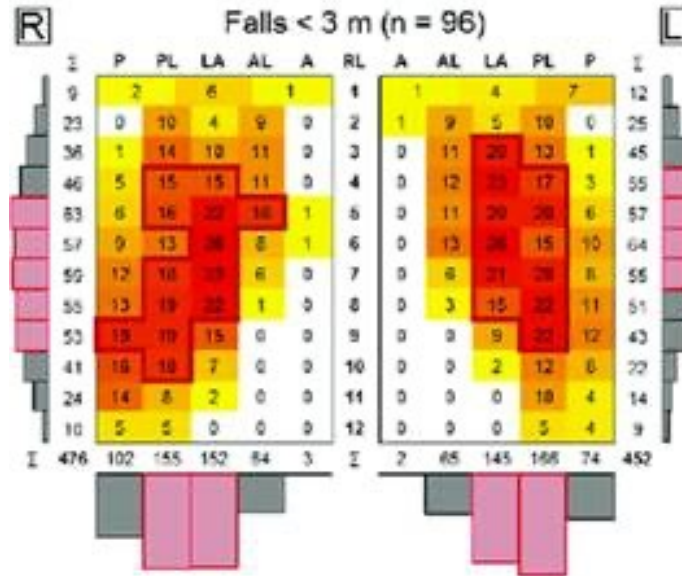
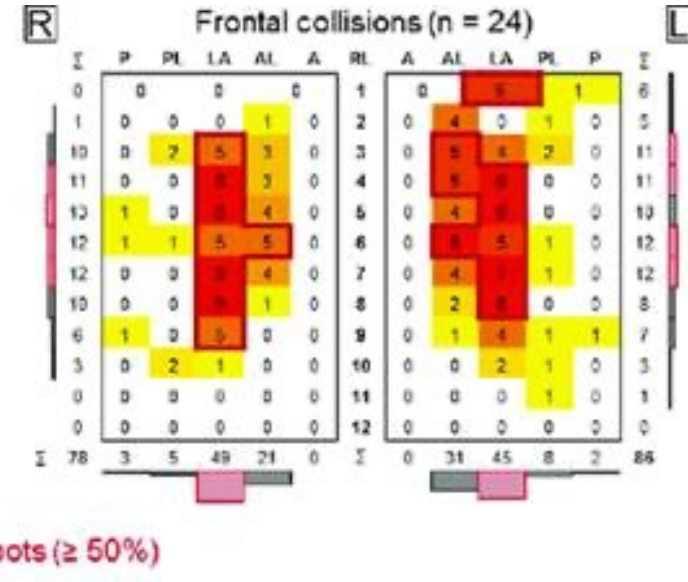
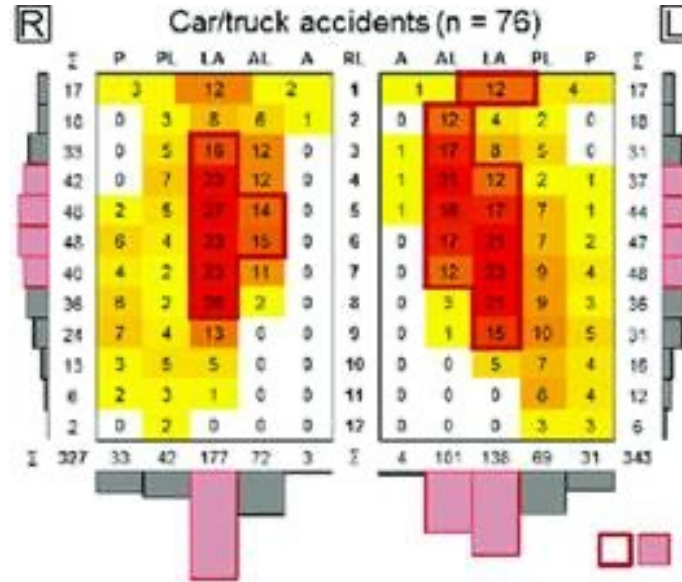


# Rib Fixation Locations per injury mechanism



RED BOXES:  
>50%

Total of **76%**  
fractures  
fixed





# Results

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Overall, 1913 ribs with surgical stabilized with the use of 2056 plates.

76% of broken ribs were surgically stabilized with only 3 patients returning to theatre for removal of the inserted prothesis.

4 patients were recorded in the 30-day mortality

83.4% of patients discharged to either home or rehabilitation in under 30 days.

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# Conclusion

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3-dimensional fixation plates have not been as popular as 2-dimensional systems. This review highlights the safe use of 3-dimensional systems with low complication & negligible prosthesis failure.

The simplicity of use allows for a high percentage of repaired ribs leading to near-complete fixation. Lower chest wall soft tissue disruption can lead to less morbidity and potentially reduced hospital stay with improvements in recovery times.

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