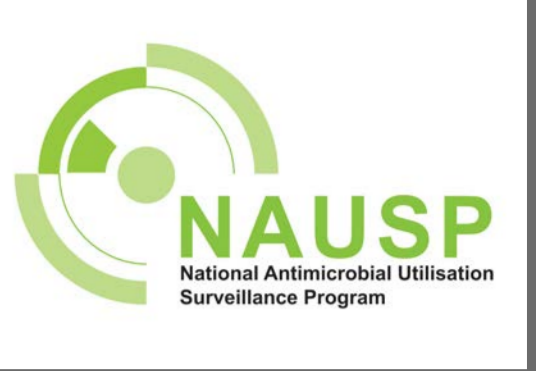


# ANTIMICROBIAL-IMPREGNATED BONE CEMENT IN AUSTRALIAN HOSPITALS: CEMENTING THE JOINTS

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## BACKGROUND

- Antibiotic-impregnated bone cement is frequently used in arthroplasty surgery to minimize the risk of infection in the prosthetic knee or hip joint.<sup>1,2</sup>
- The objective of this study was to gain greater insight into the use, documentation, and stock management of antibiotic-impregnated bone cement in Australian hospitals.



## METHODS

- The NAUSP database was searched to identify hospitals including bone cement in their monthly data submissions.
- An online survey was distributed to all NAUSP contributors to establish which department was responsible for stock management, and pharmacist knowledge of use and documentation of bone cement.



## KEY FINDINGS

- 13% of hospitals included proprietary antibiotic-impregnated bone cement in their monthly data submission to NAUSP.
- Antimicrobials that were identified by pharmacists as having been added to cement in theatre include: vancomycin, ciprofloxacin, colistin, aminoglycosides, carbapenems and antifungals.
- 53% of pharmacists who responded were unsure or find it difficult to locate documentation in the clinical notes of the bone cement used including whether antimicrobials were added.

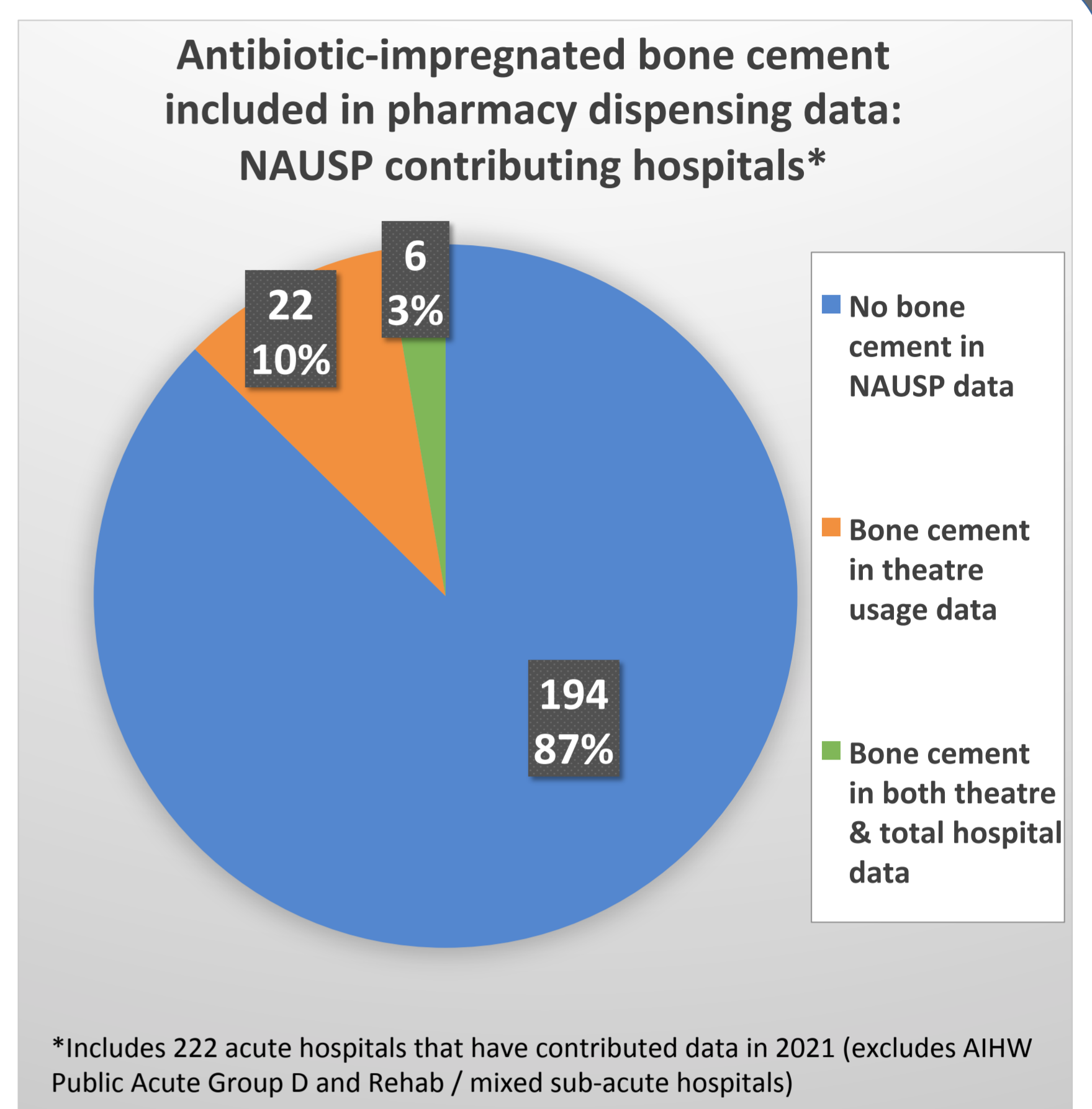


## CONCLUSION

- **Consistency in the management and documentation of antimicrobial-impregnated cement would assist in surveillance of usage, help identify variations in practice and provide opportunities for quality improvement**
- **This study has illustrated a gap in pharmacist knowledge in the peri-operative setting and highlights a possible focus for future education to assist with AMS in this setting**

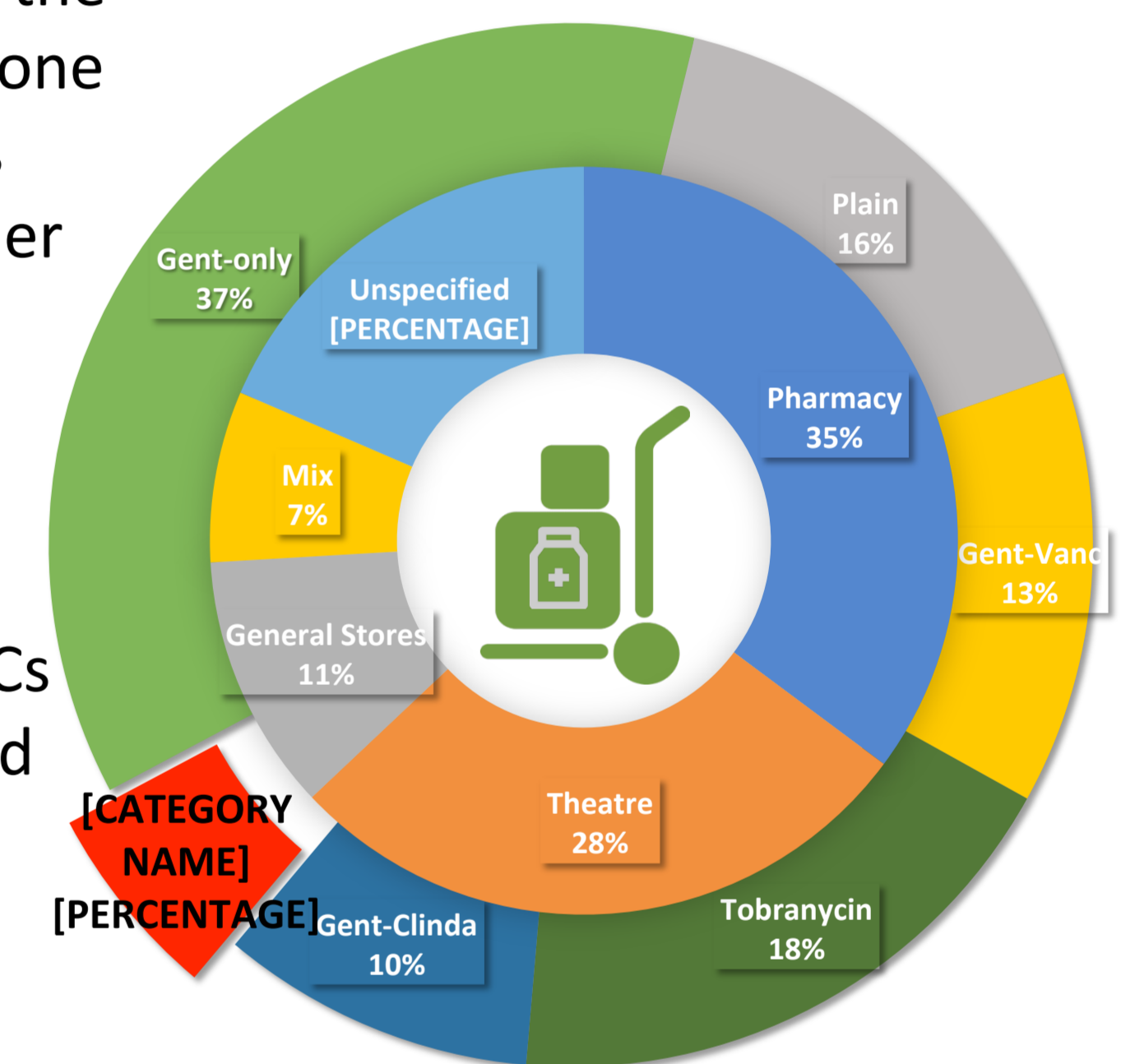
## Antimicrobial-impregnated bone cement in NAUSP surveillance data

- The surveillance of antimicrobial usage is a key component of antimicrobial stewardship (AMS), enabling the monitoring of trends in usage, the identification of inappropriate use, and the evaluation of the effectiveness of interventions to optimise usage.
- From January 2021, the National Antimicrobial Utilisation Surveillance Program (NAUSP) data inclusions were expanded to include the use of all antimicrobials in Australian hospitals, including antimicrobial-impregnated bone cement.
- 233 hospitals submitted pharmacy dispensing data to NAUSP in 2021.<sup>#</sup> Of the 233 hospitals, 222 submitted granular data for theatre. Only 13% of hospitals submitted data that included antibiotic-impregnated bone cement.



## Survey results

- 52 responses to the online survey were received.
- Approximately one third of respondents (35%) stated that the pharmacy was responsible for the stock management of bone cement in their hospitals. At other sites, bone cement was managed by the operating theatre, the general stores, other unspecified departments, or a combination (mixed management).
- For respondents whose respective hospital pharmacies do manage antibiotic-impregnated BCs, gentamicin-and tobramycin-impregnated BC was most common. Others BCs stocked included gentamicin-clindamycin combination, and gentamycin-vancomycin combination.
- **Pharmacists who responded were aware of the following antimicrobials being added to cement in theatre at their hospitals: tobramycin, amikacin, vancomycin, ciprofloxacin, ertapenem, meropenem, colistin, daptomycin, voriconazole.**



- 53% of the respondents reported difficulty locating details of bone cement and/or antimicrobial added to cement in patient clinical notes. **"I know nothing about bone cement; I wouldn't know where to look or who to talk to".**
- 38% stated details would be in the theatre notes and 9% knew to look in prosthetic records.

## Limitations

Response rates to the pharmacy survey was only 22% of NAUSP contributors (52/233 hospitals). The survey results therefore may not be representative of all Australian hospitals, nor representative of pharmacists specialised in the peri-operative clinical setting.

## Opportunities for quality improvement

- There appears to be wide variation in the clinical use and management of antimicrobial-impregnated bone cement in Australian hospitals. Routinely used proprietary products vary between hospitals with the majority utilising cement with pre-added aminoglycoside (either gentamycin or tobramycin).
- Pharmacists identified a number of broad-spectrum agents added to bone cement in theatre, however the frequency of use and the usual amount added is not clear. There is a lack of strong evidence to determine optimal practice in this setting. Further research to determine routine practice of orthopaedic surgeons would assist in developing consensus-based guidelines.
- There is an opportunity for clinical pharmacists to increase their understanding of antimicrobials added to bone cement, in particular, the stability of antimicrobials in bone cement, how and where it is documented, and the recommended antimicrobial and dose that decreases infection risk but does not compromise the joint stability. This could lead to improved care in patients who undergo arthroplasty procedures.