163. Development of an Electronic Flagging Tool for Identifying Cardiac Device Infections: Insights from the VA CART Program

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Background. Surveillance is an essential aspect of infection prevention. Despite the high morbidity and mortality associated with procedure-related Cardiac Implantable Electronic Device (CIED) infections, methods for identifying them are limited. The objective of this study was to develop an algorithm with electronic flags to facilitate detection of CIED infections in a large, multi-center cohort.

Methods. A sample of patients who underwent CIED procedures entered into the VA Clinical Assessment Reporting and Tracking Electrophysiology (CART-EP) program from FY 2007 to 2015 were included in the nested case–control study. After cohort creation, data from this review process were combined with electronic variables (e.g., microbiology orders, ICD 9/10 codes) to develop a preliminary algorithm that categorized patients as high, intermediate, or low risk of CIED infection. Results. A total of 1,014 unique patients out of a cohort of 5,955 procedures underwent manual review. Among these cases, 59 CIED infections and 955 controls were identified. Electronic variables predictive of CIED infection included ICD 9/10 infection codes and microbiology orders (table). ICD 9/10 codes had excellent PPV for flagging infections but sensitivity was limited (47.5%, see figure). Adding microbiology order flags increased sensitivity but lowered specificity. Specificity in patients without either flag was outstanding (99%).

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164. Reporting the High-resolution Structure of the Enterococcal Ribosome: A New Template for Antibiotic Discovery

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Background. The ribosome is a rich target for antibiotic design and its structural secrets have been described at the atomic level over the past 2 decades. However, most bacterial ribosome structures come from nonpathogenic species of Archaea or thermophilic bacteria. To aid in the development of modern antibiotics against the enterococcus, we report the structure of the ribosome from Enterococcus faecalis at 3.5 Å resolution using cryo-electron microscopy.

Methods. E. faecalis strain OG1 was grown in liquid culture, collected and lysed using a French press. 70S ribosomes were purified using centrifugation through a sucrose cushion followed by column chromatography and sucrose gradient centrifugation. 70S particles were diluted in buffer and applied to a holey carbon grid and using an FEI vitrobot were flash-frozen in liquid ethane. Data were collected on an FEI Titan Krios operating at 300 kV acceleration voltage. The particles classified into 6 distinct structures based on their composition. Completed maps were utilized for structure modelling using Coot and were then refined using real space refinement within Phenix.

Results. High-quality maps of the 70S ribosome were obtained at up to 3.5 Å resolution in several distinct conformations. The 23S, 16S, and 5S RNA structures were almost completely built into maps with clear density. All but 2 ribosome proteins L25

Table: Electronic flags for CIED infection

| Infection flag | Infection (N = 59) | No infection (N = 955) | OR | P-value |
|---------------|-------------------|------------------------|----|--------|
| CIED infection ICD 9/10 | 21/39 (56.4%) | 1/955 (0.10%) | 340 | <0.001 |
| Surgical site infection (SSI) ICD 9/10 | 7/39 (11.9%) | 6/955 (0.63%) | 18.9 | <0.001 |
| CIED infection or SSI ICD 9/10 | 28/59 (47.5%) | 7/955 (0.73%) | 64.7 | <0.001 |
| Micro order* | 53/59 (89.8%) | 19/955 (20.7%) | 5.4 | <0.001 |

*Blood, wound, and unclassified cultures.