**Supplementary Table 1.** Characteristics of the studies evaluating trough-based pharmacokinetic dosing in vancomycin

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| Study | Study design | Patient characteristics | Key inclusion and exclusion criteria | Sample size  (intervention vs control) | Intervention | Outcome parametera | Result  (of Intervention group) |
| Our study | Retrospective | Adult non-ICU | Inclusion (1) Age≥18 (2) Surgical department (3) Meeting criteria for PK-guided dosing recommendation according to 2009 ASHP vancomycin TDM guideline  Exclusion (1) ICU admission during vancomycin treatment | 280 (134 vs 146) for AKI  112 (61 vs 51)  for clinical outcome  53 (28 vs 25) with MRSA infection | PK equation or  Bayesian forecasting | A-I,II B C | A-I) Higher target attainment rate A-II) Similar time to initial target trough B) Similar AKI incidence  C) Similar vancomycin treatment failure No difference in dose and duration of vancomycin therapy, frequency of dose regimen change and concentration measurement |
| Dorajoo et al43  (2018) | Retrospective | Adult CKD | Inclusion (1) Baseline CrCl (Cockcroft–Gault equation using TBW) < 60 ml/min Exclusion (1) receiving renal replacement therapy | 43 (22 vs 21) | VancApp-population PK model | A-II B C | A-II) Shorter time to first target trough without statistical significance  B) higher nephrotoxicity  C) Clinical outcome – all without statistical significance. - higher mean length of hospitalization  - lower 30-day mortality  - lower 30-day readmission due to MRSA infection  - less mean vancomycin dose |
| Truong et al25  (2018) | Retrospective (matched-pair) | Adult ICU | Inclusion (1) age: 18 - 89 years  Exclusion (1) renal replacement therapy. | 100 (50 vs 50) | PK calculation | A-II B | A-II) Significantly faster goal attainment  B) lower AKI without statistical significance |
| Pea et al65  (2002) | Retrospective | Adult ICU | Inclusion  (1) critically ill patients  (2) documented or suspected gram-positive multi-resistant infection | 32 (16 vs 16) | TDM with Bayesian forecasting (Abbott PKS) | A-I | A-I) Higher proportion of mean vancomycin trough within the desired range   Smaller trough  concentration variability |
| Cardile et al32  (2015) | Pre-post intervention | Adult | Patients treated with vancomycin. For clinical outcome assessment, Exclusion (1) gram-negative or no positive culture result  (2) vancomycin-resistant organisms  (3) CKD stages III/IV/V | 340  (173 vs 167)  for AKI 145 (66 vs 75) for clinical outcome 71 (36 vs 35) with MRSA infection | PK equation guided individualized dosing | A-II B C | A-II) Shorter time to initial target trough B) Similar AKI incidence  C) Shorter hospitalization - faster achievement of clinical stability  - shorter duration of vancomycin therapy  - similar all cause in-hospital mortality and vancomycin treatment failure |
| Momattin et al20  (2016) | Pre-post intervention | Adult | Patients who received vancomycin monitoring  Inclusion  (1) ≥18 years of age Exclusion  (1) one-time orders such as those on surgical prophylaxis | 564  (286 vs 278) | Bayesian forecasting (vs nomogram) | A-II B C | A-I) higher rate of optimal trough achievement  B) decreased elevated SCr  C) decreased duration of therapy |
| Hirano et al35  (2016) | Pre-post intervention | Adult MRSA | Exclusion (1) under 18 years (2) without isolation of positive cultured MRSA (3) without symptoms of infection  (4) concomitant use of nephrotoxic agents  (5) hemodialysis | 431  (249 vs 182) for target attainment 79 (51 vs 28) for clinical outcome | PK parameter calculated by Bayesian forecasting methods | A-II B C | A-I) Higher target attainment rate   Lower variation in mean vancomycin concentration B) Similar AKI incidence  C) Similar duration and dose of vancomycin therapy - Similar 30-day mortality |
| Masuda et al38  (2015) | Pre-post intervention | Adult MRSA | Inclusion (1) at least 20 years of age Exclusion (1) concomitant nephrotoxic agent  (2) artificial dialysis | 610  (508 vs 102) | Initial dose planning by pharmacists with TDM software (SHIONOGIVCM-TDM) | A-I B | A-I) Increased target trough attainment (10 – 20 µg/mL) B) No significant difference in nephrotoxicity risk |
| Komoto et al37  (2018) | Pre-post intervention | All MRSA bacteremia | Inclusion (1) MRSA detected from one or more sets of blood culture  (2) use of vancomycin as first-line agent  Exclusion (1) use other anti-MRSA agent as first-line agent (2) hemodialysis | 76 (48 vs 28) | Initial dose planning by pharmacists with TDM software(SHIONOGIVCM-TDM) | C | C) Significant survival time prolongation until vancomycin treatment failure |
| Abulfathi et al31  (2018) | Pre-post intervention | All Gram-positive infection | All patients receiving vancomycin included, irrespective of age, sex, weight, indication for vancomycin, or comorbidities. | 157 (80 vs 77) | Computerized TDM using Bayesian forecasting (MwPharm++) | A-I | A-I) Higher probability of attaining a therapeutic concentration |
| Miller et al39  (2018) | Pre-post intervention | Pediatric oncology patient | Inclusion  (1) age 2 -13 years (2) CrCl of ≥60 mL/ min/1.73 m2 upon vancomycin initiation | 51 (16 vs 35) | Swachuk-Zaske method | A-I,II  C | A-I) Higher goal trough attainment A-II) rapid attainment of goal troughs C) no difference in number of dose adjustments - more measurements of concentration |
| Crumby et al33  (2009) | Pre-post intervention | Neonatal ICU | All NICU patients who received intravenous vancomycin Exclusion (1) previously diagnosed as having perinatal hypoxic-ischemic injury with resultant renal dysfunction. | 193  (85 vs 108) | First dose pharmacokinetic information | A-I | A-I) Increased the percentage of patients with target steady-state trough concentrations |

**Notes:** a.Outcome parameters were categorized into (A-I) Target trough attainment (A-II) Time to target trough attainment (B) Incidence of nephrotoxicity (C) Clinical outcome and dose regimen.

**Abbreviations:** ICU, intensive care unit; PK, pharmacokinetic; ASHP, American Society of Health-System Pharmacists; TDM, therapeutic drug monitoring; AKI, acute kidney injury; MRSA, methicillin-resistant *Staphylococcus aureus*; CKD, chronic kidney injury; CrCl, creatinine clearance.