**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 AKI112 (61 vs 51) for clinical outcome 53 (28 vs 25) with MRSA infection  | PK equation or Bayesian forecasting | A-I,IIBC | A-I) Higher target attainment rateA-II) Similar time to initial target troughB) Similar AKI incidence C) Similar vancomycin treatment failureNo 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/minExclusion(1) receiving renal replacement therapy  | 43 (22 vs 21) | VancApp-population PK model | A-IIBC | 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-IIB | 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 AKI145 (66 vs 75) for clinical outcome71 (36 vs 35) with MRSA infection  | PK equation guided individualized dosing | A-IIBC | A-II) Shorter time to initial target troughB) 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 monitoringInclusion (1) ≥18 years of ageExclusion (1) one-time orders such as those on surgical prophylaxis | 564 (286 vs 278) | Bayesian forecasting (vs nomogram) | A-IIBC | 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 attainment79 (51 vs 28) for clinical outcome | PK parameter calculated by Bayesian forecasting methods | A-IIBC | A-I) Higher target attainment rate  Lower variation in mean vancomycin concentrationB) 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 ageExclusion(1) concomitant nephrotoxic agent (2) artificial dialysis | 610 (508 vs 102) | Initial dose planning by pharmacists with TDM software (SHIONOGIVCM-TDM)  | A-IB | 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 attainmentA-II) rapid attainmentof goal troughsC) no difference in number of dose adjustments- more measurements of concentration |
| Crumby et al33 (2009) | Pre-post intervention | Neonatal ICU  | All NICU patients whoreceived intravenous vancomycinExclusion(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.