low-risk group (18% vs. 8%, 10% absolute risk difference), followed by the medium (24% vs. 18%, 6% difference) and high (39% vs. 33%, 6% difference) risk groups. PCT was associated with higher 30-day mortality than PMT overall (aOR, 1.54; 95% CI, 1.43–1.66), and in all three groups: low (aOR, 1.69; 95% CI, 1.50–1.89), medium (aOR, 1.30; 95% CI, 1.14–1.48), and high (aOR, 1.21; 95% CI, 1.04–1.40).

Conclusion. Older adults who received empiric combination antipseudomonal therapy for community-onset pneumonia fared worse than those who received monotherapy. Empiric combination antipseudomonal therapy should not be routinely offered to all patients suspected of having pseudomonal pneumonia.

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1882. Resistance (R) Trends in Gram-Negative Bacilli (GNB) to Fluoroquinolones (FQ), [Ciprofloxacin (CIP), Levofloxacin (LEV), Moxifloxacin (MOX)], Trimethoprim–Sulfamethoxazole (TMP/SMX) and Nitrofurantoin (NFT) over a 7-Year Period: Pre- and Post-Implementation of FQ Restriction at a Tertiary Care Veterans Affairs Medical Center (VAMC)

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Background. Unrestricted use of FQ has been associated with emergence of drug resistance in GNB. Active surveillance measures are essential components of antibiotic stewardship practice. The aim of this study was to evaluate antibiotic utilization, assess the impact of FQ restriction on resistance to FQ, TMP/SMX, and NFT, and identify quality improvement measures to prevent emergence of resistance in GNB.

Methods. A retrospective records review and comparison of antimicrobial susceptibility data for GNB isolated at the Detroit VAMC over a 7-year period, pre- and post-FQ restriction, implemented in 2013. Susceptibility testing was performed by reference broth micro-dilution methods in a central laboratory. Antibiotic usage data were obtained from pharmacy computer records from 2011 to 2017. Antibiotic use in inpatients was expressed as days of therapy/1,000 patient-days (DOT/PD) and as number of prescriptions filled for outpatients. Data were analyzed using Pearson correlation coefficient score.

Results. In 2016–2017, the most common GNB isolated in our institution were *E. coli* ($n = 303$), *Klebsiella pneumoniae* ($n = 100$), and *P. aeruginosa* ($n = 70$). Inpatient: During 2011–2012, DOT/1,000 PD for CIP, LEV and MOX were 34, 10, and 5 respectively, that dropped to 14, 5, and 3 during 2014–2017, post-FQ restriction initiated in 2013. Outpatient: During 2013–2017, outpatient CIP and MOX prescriptions decreased from 1936 to 781 and from 478 to 86, respectively; however, prescriptions for LEV, TMP/SMX, and NFT increased from 33 to 128, 680 to 1,074, and 95 to 322, respectively. Overall: resistance to CIP, LEV, and MOX had increased by 8% in *E. coli* (14–22%) and by 7% in *P. aeruginosa* (10–17%) during 2015–2017; FQ-R in *K. pneumonia* and NFT-R in *E. coli* stayed low at 7% and 2%, respectively. Also, isolates of TMP/SMX-resistant *E. coli* and NFT-resistant *K. pneumonia* increased from 20% to 27% and 40% to 51%, respectively.

Conclusion. Use of FQ among outpatients was still high (781 scripts in 2017) despite a 4-year restriction, resulting in high FQ-R in *E. coli* and *P. aeruginosa*; a concomitant increase in TMP/SMX and NFT resistance was noted, attributed to a compensatory increased use of these agents during the study period ($P < 0.05$). Reversal of resistance trends may take a few years. Antimicrobial stewardship activities need to be enhanced in both ambulatory and inpatient settings in order to achieve optimal results.

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1883. Acute Kidney Injury in Patients With Pneumonia on Concomitant Anti-Methicillin-Resistant *Staphylococcus aureus* and Anti-Pseudomonal β-Lactam Therapy

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Background. Empiric antibiotic treatment of serious and healthcare-associated pneumonia (PNA) often includes coverage of methicillin-resistant *Staphylococcus aureus* (MRSA) and *Pseudomonas aeruginosa* (PSA). Recent publications suggest that patients treated with the combination of vancomycin (V) and piperacillin–tazobactam (PT) have a greater risk of acute kidney injury (AKI) than those treated with V alone, or V in combination with another β-lactam, such as cefepime (C). There is a paucity of data regarding the risk of AKI in other regimens that provide MRSA and PSA coverage, such as linezolid (L)-PT or LC. We examined the incidence of nephrotoxicity in patients who received combination antibiotic therapy for PNA.

Methods. A retrospective cohort analysis of eligible adult patients (≥18 years) admitted from July 1, 2014 to June 30, 2017 who received ≥48 hours of combination therapy was conducted. Patients were excluded if their baseline serum creatinine was ≥1.4 mg/dL, on renal replacement therapy, or if diagnosed with cystic fibrosis. The primary outcome was incidence of AKI as defined by RIFLE criteria. Comparisons between the groups were analyzed by chi-squared test. To identify variables associated with AKI in a multivariable analysis, a repeated measures, mixed-effects logistic regression was utilized.

Results. There were 185 patient encounters included in the analysis. RIFLE-defined AKI occurred in treatment groups as follows: VPT 31/98 (31.6%); VC 5/50 (10.0%); LPT 4/12 (33.3%); and LC 4/25 (16.0%). There was a significant difference in rates of AKI among the four groups ($P = 0.019$). In pooled analyses, no difference was identified between patients receiving V or L ($P = 0.73$); however, patients who received PT had a higher incidence of AKI compared with those that received C ($P = 0.002$). In logistic regression analyses, independent predictors of AKI were receipt of PT vs. C (odds ratio [OR] 3.2, 95% confidence interval [CI] 1.3–8.0) and SOFA score ≥9 (OR, 4.5; 95% CI 1.6–12.7).

Conclusion. No differences in AKI incidence were found between patients receiving vancomycin or linezolid; however, patients receiving piperacillin–tazobactam and those with SOFA scores ≥9 had a higher rate of AKI.

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1884. Assessment of Potential Antimicrobial-Related Harms in Hospitalized Adults With Common Infections

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Background. Recent data suggest antibiotic-related harm occurs in 1 in 5 hospitalized patients. The purpose of this study was to critically evaluate potential adverse-drug-events (ADE) associated with antimicrobial administration in hospitalized family medicine (FAM) patients.

Methods. Retrospective cohort of adults receiving antimicrobial therapy for respiratory, urinary, and skin infection on an inpatient FAM ward between January 2017 and March 2018. Primary endpoint: potential ADEs up to 30-day post-therapy, identified using inpatient and outpatient electronic medical records. ADEs were classified as mild, moderate, or severe; Naranjo scores were used to classify causality. Other endpoints included risk associated with ADE, subsequent 30-day readmissions, and infections due to multidrug-resistant organisms up to 90-days post-therapy.

Results. 1,499 antibiotic days were assessed in 150 hospitalized adults. Fifty-four patients with at least one potential ADE (68 total) were identified. By Naranjo score, 10 (6.7%) patients had "probable" antibiotic related ADEs (score 5–8), all others were "possible" (score 1–4). Excluding patients with diarrhea receiving concomitant laxatives, 36 patients (24%) suffered from 50 potential ADEs, approximately 3.33 per 100 antibiotic days (Table 1). Thirteen (9.3%) had serious ADEs; 6 were receiving concomitant medications which may have contributed to harm, primarily nephrotoxins (5/6). Alteration of antimicrobial therapy was attributed to ADEs in 12/54 cases (22.2%) while 6 (11.1%) led to 30-day hospital or emergency department (ED) revisits. ADEs were not associated with any specific antimicrobial. Patients with ADEs were more likely to have ED/hospital revisits (OR = 2.42 [1.16–5.05]) and receive more total antibiotic days (11 [6–15] vs. 8 days [6–12 days], $P = 0.036$) compared with those who did not.

Conclusion. One in four hospitalized FAM patients receiving antimicrobials experienced potential ADE. While varying in nature and severity, antimicrobial ADEs contribute to serious harm. These findings underscore need for improved awareness and judicious use.

	n (%) (n=150)	Naranjo score (range)
Patients experiencing only mild/moderate ADE	41 (27.3)	3 (1—7)
Gastrointestinal		
o Any diarrhea	24 (16)	3 (1—7)
o Diarrhea without laxative	6 (4)	4 (3—7)
o Nausea/vomiting	7 (4.7)	3 (1—5)
Cardiac		
o QTc prolongation no event	8 (5.3)	4 (3—4)
Renal (risk)*	9 (6)	3 (2—5)
Transaminitis	2 (1.3)	4 (2—6)
Altered mentation/neuropathy	3 (2)	4 (3—5)
Patients experiencing severe ADE	13 (8.7)	4 (3—7)
Hematologic	5 (3.3)	4 (3—6)
Renal injury/failure*	4 (2.7)	4.5 (3—6)
C. difficile diarrhea	1 (0.7)	7
Neurotoxicity	2 (1.3)	4
Anaphylaxis/hives	1 (0.7)	4
Cardiac event	2 (1.3)	4 (2—6)
Subsequent infection with MDRO**	7 (4.7)	n/a

*AKIN criteria by serum creatinine increase

**Multi-drug resistant organisms: MRSA, VRE, ESBL, CRE, MDR *Pseudomonas* or *Acinetobacter* spp without prior colonization

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