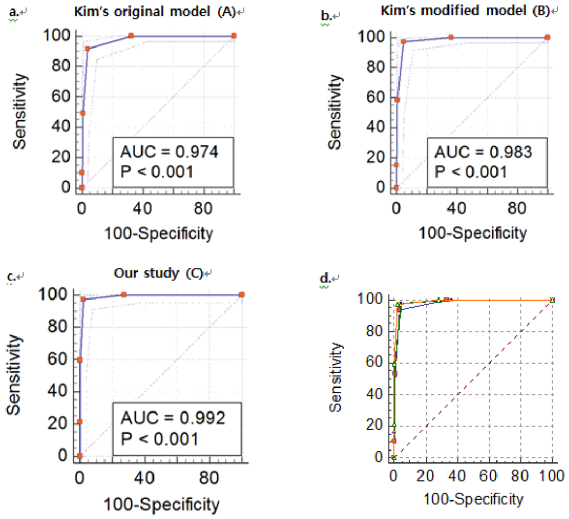
Multivariable logistic regression analysis	Odds ratio (95% CI)	*P* value	AUC (95% CI)	*P* value	Sensitivity (95% CI)	Specificity (95% CI)
Altered mental status	5.681 (1.369-23.571)	0.017	0.974 (0.949-0.989)	<0.001	91.9 (86.3-95.7)	96.3 (91.6-98.8)
Leukopenia (WBC count<4000/μL)	75.879 (14.418-399.323)	<0.001				
Prolonged aPTT (>40seconds)	80.133 (14.369-446.877)	<0.001				
Normal CRP (≤1.0mg/dL)	166.855 (23.482-1185.613)	<0.001				
Altered mental status	15.385 (2.216-106.828)	0.006	0.983 (0.960-0.995)	<0.001	97.3 (93.2-99.3)	95.6 (90.6-98.4)
Leukopenia (WBC count<4000/μL)	92.573 (14.971-572.430)	<0.001				
Prolonged aPTT (>40seconds)	65.010 (10.510-402.105)	<0.001				
Normal CRP (≤3.0mg/dL)	184.937 (35.731-957.207)	<0.001				
Leukopenia (WBC count<4000/μL)	145.404 (12.686-1666.604)	<0.001	0.992 (0.971-0.999)	<0.001	97.3 (92.4-99.4)	97.8 (93.6-99.5)
Prolonged aPTT (>40seconds)	250.124 (18.403-3399.536)	<0.001				
Normal CRP (≤3.0mg/dL)	172.021 (26.289-1125.629)	<0.001				
Elevated CK (>1000IU/L)	192.616 (8.307-4466.445)	0.001				

<Table 3. Multivariable logistic regression analysis of predictive parameters for severe fever with thrombocytopenia syndrome and Diagnostic performance of clinical scoring in differentiating severe fever with thrombocytopenia syndrome>

Abbreviations: CI=confidential intervals; WBC=White blood cell; aPTT=activated partial thromboplastin time; CRP=C-reactive protein; CK=creatine kinase



<Figure 1. Receiver operating characteristic(ROC) curves of the multivariable logistic regression models (a. model A: Altered mental status, Leukopenia, Prolonged aPTT, Normal CRP (≤1.0mg/dL), b. model B: Altered mental status, Leukopenia, Prolonged aPTT, Normal CRP (≤3.0mg/dL), c. model C: Leukopenia, Prolonged aPTT, Normal CRP (≤3.0mg/dL), Elevated CK (>1000IU/L), d. square: model A, circle: model B, triangle: model C) for Severe fever with thrombocytopenia syndrome predictive model>

Disclosures. **All authors:** No reported disclosures.

2187. Prediction of Patient Outcome During Febrile Neutropenia Despite Anti-infective Treatment Using Machine Learning Algorithms

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Background. Clinical management of prolonged febrile neutropenia despite broad-spectrum empirical antibacterial treatment is a clinical challenge, as standard empirical treatment has failed and a broad spectrum of differential diagnoses has to be considered. Growing prevalence of multi-resistant bacteria and fungi has made a balanced choice of effective anti-infective treatment more difficult. A reliable prediction of complications could indicate options for treatment optimization.

Methods. We implemented a supervised machine learning approach to predict death or admission to intensive care unit within 28 days in cancer patients with prolonged febrile neutropenia (neutrophils < 500/mm^3 and body temperature ≥ 38°C longer than 3 days). We analyzed highly granular retrospective medical data of the Cologne Cohort of Neutropenic Patients (CoCoNut) between 2008 and 2014. Random forest and 10-fold cross-validation were used for classification. The neutropenic episodes from 2014 were used for evaluation of prediction.

Results. In total, 927 episodes of prolonged febrile neutropenia (median age 52 years, interquartile range 42–62; 562/927 [61%] male; 390/927 [42%] acute myeloid leukemia; 297/927 [32%] lymphoma) with 211/927 (23%) adverse outcomes were processed. We computed 226 features including patient characteristics, medication, clinical signs, as well as laboratory results describing changes of state and interactions of medical parameters. Feature selection revealed 65 features with an area under the receiver operating characteristic curve (AUC) of 0.75. In the validation data set the optimized model had a sensitivity/specificity of 36% and 99% (AUC: 0.68; misclassification error: 0.12) and positive/negative predictive values of 89% and 88%, respectively. The most important features were albumin, age, and procalcitonin.

Conclusion. Structured granular medical data and machine learning approaches are an innovative tool that can be used in a retrospective setting for prediction of adverse outcomes in patients with prolonged febrile neutropenia. This study is the first important step toward clinical decision support based on predictive models in high-risk cancer patients.

Disclosures. **All authors:** No reported disclosures.

2188. Provider Education and Rapid Antigen Detection Test Use in Private and Academic Pediatric Clinics

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Background. Rapid antigen detection testing (RADT) is needed to differentiate Group A Streptococcal (GAS) pharyngitis from viral pharyngitis. Guidelines do not recommend RADT in patients with viral symptoms or in children <3 years old without GAS exposure. Reduction in unnecessary RADT use may impact inappropriate antibiotic use by decreasing prescriptions in children likely colonized with GAS. We examined the impact of guideline concordant education of appropriate RADT and antibiotic use in pharyngitis on providers' (physician and APRN) use of RADT in an academic and private pediatric primary care clinic.

Methods. Retrospective chart review of 1,085 healthy children, age 1–5 years old, seen in clinics between September 2015 and March 2019 (355 pre- and 730 post-education; 211 academic and 874 private). Education occurred in 3/2017. Cases selected had either complaint of sore throat, RADT, or diagnosis of GAS pharyngitis or pharyngitis. Data collected included the presence of viral symptoms (e.g., cough, rhinorrhea), RADT/GAS culture results, diagnosis, and prescribed antibiotics. RADT was deemed unnecessary for all children < 3 years old without GAS exposure, in patients with ≥ 2 viral symptoms, or in patients ≥ 3 years old without pharyngitis.

Results. Overall, RADT use decreased from pre to post intervention (72.1% vs. 23.4% of patients, $P \leq 0.0001$). Unnecessary RADT use decreased overall (50.4% vs. 16.2%, $P \leq 0.0001$), in all clinics (private: 56.2% vs. 16.0%, $P \leq 0.0001$; academic: 38.1% vs. 17.4%, $P = 0.0012$), and with all providers (physician: 41.6% vs. 18.3%, $P \leq 0.0001$; APRN: 58.8% vs. 14.1%, $P \leq 0.0001$). Unnecessary RADT use decreased for children <3 years old (28.1% vs. 7.4%, $P \leq 0.0001$) and ≥2 viral symptoms (65.7% vs. 16.5%, $P \leq 0.0001$).

Conclusion. Unnecessary RADT use decreased in the post-education period overall (34%), in children <3 years old (21%), and in patients with ≥ 2 viral symptoms (49%). Reductions were also seen in both academic (21%) and private (40%) clinics as well as with both physicians (23%) and ARPNs (45%). Limitations include lack of a control group and sample size variance by the clinic. We observed positive trends in RADT reduction following provider education in private and academic settings; however, further research including control and optimal sample size is needed to confirm any direct impact.