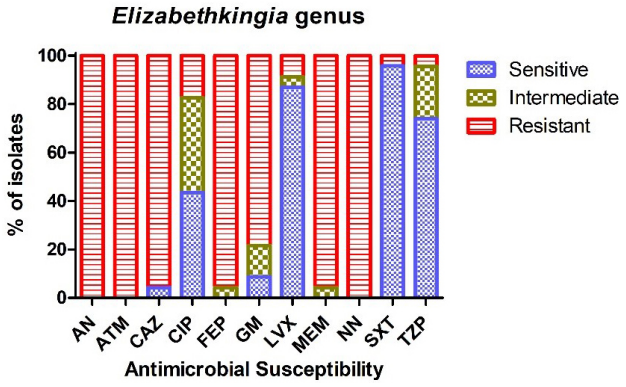
Table 2. Clinical Isolation Sites of *Elizabethkingia* spp.		
	Number of isolates (n=55, %)	Polymicrobial[1] (n=32, %)
Blood, CVC	11 (20)	3 (9.4)
Blood, peripheral	13 (23.6)	1 (3.1)
Catheter tip	1 (1.8)	0
Sputum/tracheal secretions	10 (18.2)	10 (31.3)
Bronchoscopy/BAL	13 (23.6)	12 (37.5)
Sinuses	2 (3.6)	2 (6.3)
Peritoneal	1 (1.8)	0
Contact lens	2 (3.6)	2 (6.3)
Lens solution	2 (3.6)	2 (6.3)
CVC=central venous catheter; BAL=bronchoalveolar lavage; (1) = number of clinical isolates that grow at least one other bacteria.		

Table 3. Antimicrobial susceptibilities of *Elizabethkingia* genus[1]						
	Breakpoint (mcg/ml)			Susceptibility (%)		
	S	I	R	S	I	R
Amikacin	≤16	32	>32	0	0	100
Aztreonam	≤8	16	>16	0	0	100
Ceftazidime	≤8	16	>16	4.3	0	95.7
Ciprofloxacin	≤1	2	>2	43.5	39.1	17.4
Cefepime	≤8	16	>16	0	4.3	95.7
Gentamicin	≤4	8	>8	8.7	13	78.3
Levofloxacin	≤2	4	>4	87	4.3	8.7
Meropenem	≤4	8	>8	0	4.3	95.7
Tobramycin	≤4	8	>8	0	0	100
TMP-SMX	≤2/38	-	>2/38	95.7	0	4.3
Piperacillin-tazobactam	≤16/4	32/4 64/4	>64/4	73.9	21.7	4.3
S=sensitive; I=intermediate; R= resistant; ml=milliliter; mcg=microgram; TMP-SMX=trimethoprim-sulfamethoxazole						

Conclusion. *Elizabethkingia* spp. can result in respiratory, bloodstream, and sinus infections especially in patients with active malignancy and tracheostomy. Amongst tested antimicrobials, trimethoprim-sulfamethoxazole showed the most favorable susceptibility profile (Figure 1).

Figure 1.



AN, amikacin; ATM, aztreonam; CAZ, ceftazidime; CIP, ciprofloxacin; FEP, cefepime; GM, gentamicin; LVX, levofloxacin; MEM, meropenem; NN, tobramycin; SXT, sulfamethoxazole/trimethoprim; TZP, piperacillin/tazobactam.

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652. Comparison of QuantiFERON-TB Gold Plus and T-SPOT.TB in the Diagnosis of Active Tuberculosis

Lifan Zhang, n/a[1]; zhengrong yang, MD[1]; Xiaoqing Liu, Professor[1]; Huimin Ma, MD[2]; Qiping Ge, Master[3]; Yueqiu Zhang, Bachelor[2]; Xiaochun Shi, MD[2]; Qifei Cao, Bachelor[4]; Mengqiu Gao, Bachelor[3]; [1]Peking Union Medical College Hospital, Beijing, China; [2]Peking Union Medical College Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing, China; [3]Beijing Chest Hospital, Capital Medical University/Beijing, Beijing, China; [4]Peking Union Medical College Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College,, Beijing, China

Session: P-29. Diagnostics: Bacteriology/mycobacteriology

Background. **Objective:** To compare the accuracy of Quantiferon ®- TB Gold Plus (QFT-Plus) and T-SPOT.TB in the diagnosis of active tuberculosis (ATB).

Methods. From April 2020 to May 2021, patients with pathologically confirmed or clinically diagnosed ATB in Peking Union Medical College Hospital and Beijing Chest Hospital were enrolled as case group, while patients excluded from ATB in the same period were enrolled as control group, The clinical and laboratory information were collected. QFT-Plus and T-SPOT. TB were tested simultaneously to evaluate the consistency of the results and compare the sensitivity, specificity, predictive values and likelihood ratios for diagnosing ATB.

Results. Fifty-seven ATB patients and 159 non-ATB patients were included. 33 (57.9%) ATB patients were pathologically confirmed. The proportions of indeterminate results in QFT-Plus and T-SPOT.TB were 3.7% vs 0%, respectively. The agreement between the results of the QFT-Plus and T-SPOT.TB was substantial (kappa=0.644, p < 0.001). The area under the ROC curve of the QFT-Plus and T-SPOT.TB for diagnosing ATB was 0.759 (95%CI 0.689-0.829) vs 0.810 (95%CI 0.742-0.877), respectively, and there was no significant difference (p=0.303). the sensitivity of the QFT-Plus and T-SPOT.TB was 85.2% vs 89.5%, while the specificity was 61.7% vs 52.2%, respectively. In 33 Patients with pathologically confirmed ATB, the sensitivity of QFT-Plus and T-SPOT.TB was 87.9% vs 93.9% (p=0.669), respectively. In 78 patients (36.1%) who received glucocorticoid / immunosuppressive / biological agents, the positive rate of QFT-Plus was 35.9% (28/78), which was significantly lower than that of those who did not receive these agents (77 / 138pm,55.8%) (p=0.005), but there was no significant difference in the positive rate of T-SPOT.TB between the two groups (52.6% vs. 62.3%, p=0.162). The positive rate for both tests was independent of the peripheral blood lymphocyte count (p=0.675 for QFT-Plus vs. P=0.138 for T-SPOT.TB).

Table1.The accuaracy of QFT-Plus and T-SPOT.TB for diagnosing ATB

	Sen (%, 95%CI)	Spe (%, 95%CI)	PPV (95%CI)	NLR (95%CI)	PPV (%, 95%CI)	NPV (%, 95%CI)
QFT-Plus	85.2(72.9-93.4)	61.7(53.5-69.4)	2.22(1.77-2.80)	0.24(0.13-0.46)	43.8(34.1-53.8)	92.2(85.3-96.6)
T-SPOT.TB	89.5(78.5-96.0)	52.2(44.2-60.2)	1.87(1.56-2.25)	0.20(0.09-0.44)	40.2(31.6-49.2)	93.3(85.9-97.5)

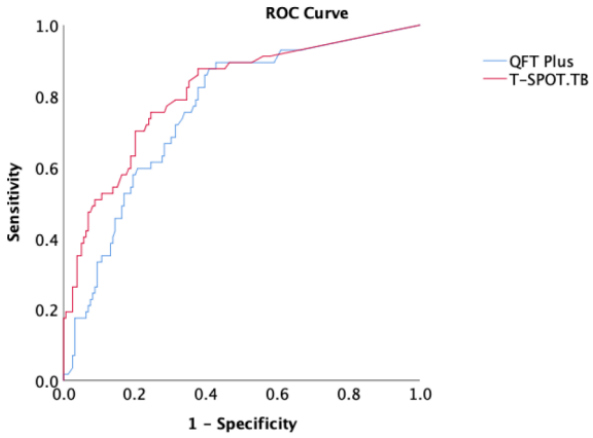

figure. ROC curve of QFT-Plus and T-SPOT.TB diagnosis of ATB

Conclusion. There was no significant difference between the QFT-Plus and T-SPOT.TB in the diagnosis of ATB. QFT-plus might be prone to indeterminate results and influenced by the immunosuppressive status. The results need to be verified by a prospective cohort study with large sample.

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653. Direct Identification of Microorganisms in Positive Blood Cultures by the BioFire® FilmArray® Blood Culture Identification Panel Leads to Faster Optimal Antibiotic Therapy: A Before–After Study

Jessica Agnetti, B.A.[1]; Andrea C. Büchler, M.D.[2]; Michael Osthoff, M.D.[3]; Fabrice Helfenstein, PhD[4]; Vladimira Hinic, PhD[3]; Sarah Tschudin-Sutter, Prof.[3]; Veronika Bättig, M.D.[3]; Nina Khanna, Prof.[3]; Adrian Egli, Prof. Dr. med. et Dr. phil.[3]; [1]University of Basel, Basel-Stadt, Switzerland; [2]Erasmus University Medical Center, Rotterdam, Zuid-Holland, Netherlands; [3]University Hospital Basel, Basel-Stadt, Switzerland; [4]University hospital Basel, Basel-Stadt, Switzerland

Session: P-29. Diagnostics: Bacteriology/mycobacteriology

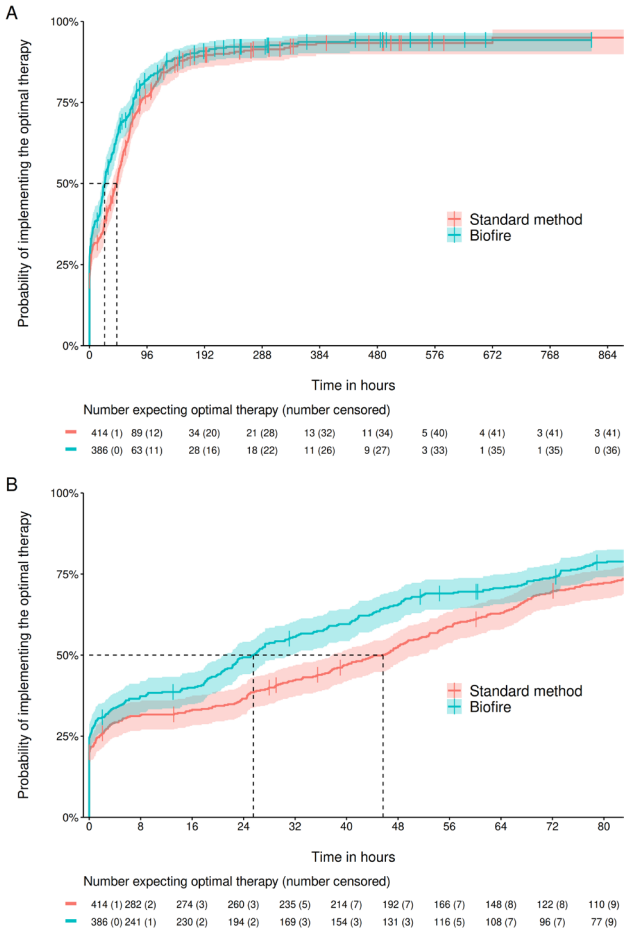
Background. Rapid pathogen identification from positive blood cultures may help optimize empiric antibiotic therapy quickly by reducing unnecessary broad spectrum antibiotic use and may improve patient outcomes. The BioFire® FilmArray® Blood Culture Identification Panel 1 (BF-FA-BCIP) identifies 24 pathogens directly from positive blood cultures without subculture. 3 resistance genes are included. We aimed to compare the time to optimal antibiotic therapy between BF-FA-BCIP and conventional identification.

Methods. We performed a single-center retrospective case-control before-after study of 386 cases (November 2018 to October 2019) with BF-FA-BCIP compared to 414 controls (August 2017 to July 2018) with conventional identification. The primary study endpoint was the time from blood sampling to implementation of optimal antimicrobial therapy. Secondary endpoints were time to effective therapy, length of hospital stay, and in-hospital and 30-day mortality. Outcomes were assessed using cause-specific Cox Proportional Hazard models and logistic regressions.

Results. We included 800 patients with comparable baseline characteristics. Main sources of blood stream infection (BSI) were urinary tract infection and intra-abdominal infection (19.2% vs. 22.0% and 16.8% vs. 15.7% for case and control groups, respectively). Overall, 212 positive blood cultures were considered as contaminations. Identification results were available after a median of 21.9 hours by the BF-FA-BCIP

and 44.3 hours by the conventional method. Patients with BF-FA-BCIP received the optimal therapy after a median of 25.5 hours (95%CI 21.0 - 31.2) as compared to 45.7 hours (95%CI 37.7 - 51.2) in the control group (Figure 1). We found no effect of the identification method on secondary outcomes.

Kaplan-Meier curve representing the probability of implementing the optimal therapy at any given time according to the identification method (Standard vs. BF-FA-BCIP).



Shaded ribbons represent the 95 % confidence interval (CI). The vertical dashes represent censored data. The vertical dotted lines represent the median time, i.e. the time at which 50 % of the patients obtained the optimal therapy, for the two methods. Median (95 % CI) time to optimal therapy is 45.7 (37.7 - 51.4) hours with the Standard method and 25.5 (21.0- 31.2) hours with Biofire. The tables below the curves present the numbers expecting optimal therapy according to the bacteria identification method, as well as the number of censored data in parenthesis. Panel A shows data from 0 to 900 hours. Panel B shows the data from 0 to 90 hours to better visualize how the probability to implement optimal therapy varies in the first 72 hours.

Conclusion. In conclusion, rapid pathogen identification by BF-FA-BCIP was associated with an almost 24h earlier initiation of the optimal antibiotic therapy in BSI. However, the overall benefit for individual patients seems to be limited. Future studies should assess the cost-effectiveness and impact on the prevention of antibiotic resistance using this diagnostic approach.

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

654. Performance of the T2Resistance Panel in Detecting Antibiotic Resistant Bacteria Directly in Whole Blood, and Implications for Improving Appropriate Therapy of Bloodstream Infections

Abigail Skeel, n/a[1,2]; Cornelius J. Clancy, MD[1]; Aaron Lucas, MD[2]; Kailey L. Hughes, MPH[2]; Ryan K. Shields, PharmD, MS[1]; Minh-Hong Nguyen, MD[1]; [1]University of Pittsburgh, Pittsburgh, PA; [2]University of Pittsburgh Medical Center, Pittsburgh, PA

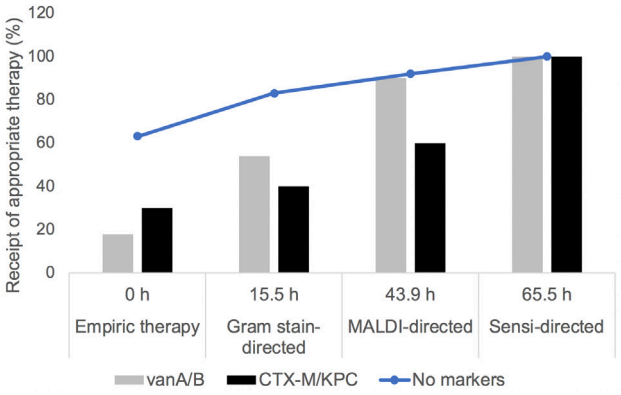
Session: P-29. Diagnostics: Bacteriology/mycobacteriology

Background. Appropriate antibiotic (Ab) therapy of bloodstream infections (BSI) is often delayed by time to blood culture (BC) positivity, species (sp) identification and Ab sensitivity (sensi). The T2Resistance (T2R) Panel is a direct-from-blood (culture-independent) diagnostic that detects 13 genetic markers associated with methicillin-resistant *S. aureus* (MRSA), vancomycin-resistant Enterococcus (VRE), ESBL- and carbapenemase-producing Enterobacteriaceae (E). We assessed T2R performance in detecting these resistant bacteria in whole blood (WB) and analyzed possible impact on time to appropriate Ab.

Methods. We performed T2R using WB samples obtained from patients (pts) on the same day as BCs from July 2019-2020. Receipt of appropriate Ab was assessed at time of empiric, Gram stain-directed, MALDI-directed (sp identification) and sensi-directed therapy. T2R results were not available to care teams. Teams were notified of positive BCs. Stewardship optimized Abs based on sensi.

Results. BC from 103 pts grew 114 bacterial sp: E (n=54; 16 ESBL-, 1 KPC-producer), *S. aureus* (n=29, 22 MRSA), Enterococcus (n=21, 16 VRE), *P. aeruginosa* and others (n=10). 12 ESBL-E produced CTX-M 14/15. T2R sensitivity and specificity was 78% and 99%, respectively, compared to sequencing of resistance markers. Sensitivity was excellent for vanA/B, KPC (100% each), and CTX-M14/15 (92%); sensitivity was 58% for mecA/C. T2R detected resistance determinants in 3-7h. Median time to appropriate Ab was 16.3h, which was significantly longer for VRE (25.6h) and ESBL- or KPC-E (50.9h) BSIs than for T2R marker-negative bacteria (6.7h; p=0.04). Pts with VRE or ESBL-/KPC-E BSI were less likely to received appropriate empiric Ab (18% and 30%, respectively) than pts with T2R marker-negative BSI (63%; p=0.02; Fig.1). Median times to achieve ≥80% appropriate Ab therapy of marker-negative, VRE and CTX-M/KPC-E BSIs were 15.5h (after Gram stain), 43.9h (after MALDI) and 63.5h (after sensi), respectively.

Antibiotic Therapy



Conclusion. There was a significant delay in appropriate Ab therapy of BSIs, especially in pts infected with VRE and ESBL/KPC-E. T2R rapidly and accurately detected BSI caused by VRE and ESBL/KPC-E, and has the potential to significantly shorten time to appropriate Ab.

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655. Patterns of Interferon-Gamma Release Assay (IGRA) Testing for Tuberculosis in Patients Less Than 2 Years Old

Mary Tabatneck, MD[1]; Jeffrey Campbell, MD[1]; Mingwei Sun, BA[1]; Wei He, M.S.[2]; Gabriella S. Lamb, MD, MPH[1]; Gabriella S. Lamb, MD, MPH[1]; Don Goldmann, MD[3]; Vishakha Sabharwal, MD[4]; Thomas Sandora, MD MPH[1]; Jessica Haberer, MD, MSc[2]; [1]Boston Children's Hospital, Boston, MA; [2]Massachusetts General Hospital, Boston, MA; [3]Boston Children's Hospital, Harvard Medical School, Washington, DC; [4]MD, Boston, MA

Session: P-29. Diagnostics: Bacteriology/mycobacteriology

Background. The American Academy of Pediatrics recommends use of Interferon-Gamma Release Assays (IGRAs) to diagnose tuberculosis (TB) infection in patients ≥2 years old. However, IGRAs are not currently recommended in younger patients due to limited data and concerns of invalid/indeterminate test results, which occur if there is a positive or negative control failure. We sought to characterize the patterns of IGRA use in clinical practice and results of IGRAs in patients < 2 years old.

Methods. We conducted a retrospective cohort study of children < 2 years old at two large health systems in the Boston area who had IGRA and/or tuberculin skin test (TST) performed from October 1, 2015 – January 31, 2021. We reviewed medical records to determine IGRA test type, IGRA result (positive, negative, invalid/indeterminate) and location of testing (outpatient primary care, outpatient subspecialty, inpatient). We summarized test interpretability, location, and changes in proportion of IGRA vs. TST.

Results. We identified 330 IGRA (268 T-SPOT.TB, 62 QuantiFERON Gold) and 2029 TST results among 1982 patients who were < 2 years old (range: 11 days – 1.9 years). Monthly proportion of IGRAs among all TB tests ordered increased from 2015 to 2021 (Figure 1) (Pearson correlation coefficient 0.85, P < 0.001). Among IGRA results, 314 (95%) were negative, 3 (1%) were positive, and 13 (4%) were invalid/indeterminate (11 T-SPOT.TB, 2 QuantiFERON Gold). Of 324 IGRA tests for which testing location was known, 233 (72%) and 91 (28%) were ordered in outpatient and inpatient settings, respectively. Of tests in outpatient settings, 132 (57%) were ordered in primary care offices, 53 (23%) were ordered in subspecialist offices, and 48 (21%) were obtained in outpatient labs of unidentified clinics.

Tuberculosis infection tests and proportion IGRA.