2037. Utilization of the T2 Magnetic Resonance in the Early Detection of Invasive Candidiasis

Sonal Patel, PharmD, BCPS[1]; David Behrman, MD (2021)[2]; Andrew Chao, MD[3,4]; Allison McMullen, PhD[5]; Jose Vazquez, MD, FACP, FIDSA[4] and Arni Sr Srinivasa Rao, PhD[6]; [1]Pharmacy, Augusta University Medical Center, Augusta, Georgia, [2]Augusta University at the Medical College of Georgia, Augusta, Georgia, [3]Infectious Diseases, Baylor College of Medicine, Houston, Texas, [4]Infectious Diseases, Augusta University Medical Center, Augusta, Georgia, [5]Augusta University Medical Center, Augusta, Georgia, [6]Population Health Sciences, Medical College of Georgia/Augusta University, Augusta, Georgia

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Background. The current gold standard for diagnosing invasive *Candida* infections is by blood culture, which has low specificity and take up to 2–5 days to grow. T2 magnetic resonance (T2MR) rapidly detects *Candida* species with high sensitivity/specificity. T2MR identifies five *Candida* species and reports it in three groups: *C. albicans/C. tropicalis*, *C. parapsilosis*, and *C. glabrata/C. krusei.*

Methods. This was a retrospective quasi-experimental study at the Augusta University Medical Center. Patients with a positive sterile site culture for *Candida* species and/or T2MR result were reviewed between April 2014 and March 2016 (pre-T2MR group) and April 2016–May 2017 (T2MR group).

Results. The pre-T2MR group consisted of 84 patients who had a *Candida* species isolated from a sterile site culture. The T2MR group consisted of 396 unique patients for whom there were a total of 549 T2MR tests ordered. Of these, 34 were positive, 466 were negative result, and 49 were invalid result (due to malfunctioning of T2MR). Of the 35 tests that were T2MR negative but sterile site culture positive, 27 (77%) of the cultures isolated a *Candida* sp. that should be detected by the T2MR but did not. The most common site of isolation for these cultures was intraabdominal (41%), followed by blood (33%). For 23% of these results, sterile site cultures grew a Candida that the T2MR does not detect.

Table 1: Performance of T2MR Results in Comparison to Sterile Site Cultures

	T2 + (n = 549)	T2 - (n = 466)
Sterile site culture +	16	35
Sterile site culture –	18	431

Table 2: Comparison Between Invasive Candidiasis as Detected by Standard Blood Cultures (Pre-T2MR) and T2MR

	Pre-T2MR	T2MR	*P*-value
Time to identification of *Candida* ±SD (hours)	± 210.1	± 14.4	0.00
All-cause 30-day mortality, *n* (%)	19 (23%)	7 (23%)	0.56

Conclusion. Unfortunately, Candida that grew in sterile site cultures was not always detected by the T2MR, particularly for intraabdominal Candidiasis. T2MR is thought to have high sensitivity and specificity for detecting Candidemia, but in our limited experience, it was found that up to one-third of Candidemias (as diagnosed by blood cultures) were missed by the T2MR. The most common *Candida* isolate in the T2MR group was *C. parapsilosis*, which is not typically thought of as a leading cause of invasive candidiasis.

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2038. Invasive Mucormycosis Management: Mucorales PCR Provides Important, Novel Diagnostic Information

Kyle Wilgers, BS[1]; Joel Waddell, DO[2]; Aaron Tyler, BS[1]; Michelle Altrich, PhD[1]; Allyson Hays, MD[3]; Steve Kleiboeker, PhD[1]; Dwight Yin, MD, MPH[4] and Mark Wissel, PhD[1]; [1]Viracor Eurofins Clinical Diagnostics, Lees Summit, Missouri, [2]Children's Mercy Hospitals and Clinics, Kansas City, Missouri, [3]Hematology/Oncology, Children's Mercy Hospital - Kansas City, Kansas City, Missouri, [4]Pediatrics, University of Missouri-Kansas City School of Medicine, Kansas City, Missouri

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Background. In immunocompromised patients, high mortality and morbidity of invasive mucormycosis (IM) remain significant healthcare issues due in part to confusion of IM with invasive aspergillosis (IA) and failure to initiate appropriate therapy. A validated *Mucorales* (MUC) PCR detects the causative agents of IM with good sensitivity and specificity, as reported previously (M-227, ICAAC 2013). Published studies have not definitively determined the frequency of patients for whom pulmonary IA is suspected but IM is present. We aimed to (1) estimate the frequency of MUC PCR positivity in bronchoalveolar lavage (BAL) samples submitted for *Aspergillus* (ASP) PCR panel testing.

Methods. We identified 1,067 clinical BAL specimens originally submitted to a reference laboratory for ASP PCR panel testing. Eluates from DNA extraction were tested by MUC PCR, which detects known pathogens from seven *Mucorales* genera (*Apophysomyces*, *Cunninghamella*, *Lichtheimia [previously Absidia]*, *Mucor*, *Rhizomucor*, *Rhizopus and Saksenaea*).

Results. The proportions of MUC PCR and ASP PCR positive BAL specimens were 1.5% (16) and 6.9% (74), respectively. 87.5% (14/16) of the MUC positive (POS) were ASP negative (NEG). One patient had two MUC PCR POS BAL samples within the testing period. The MUC quantification averaged 20,000 copies per mL BAL (range 24–266,000), which is >1,000-fold above the assay the 20 copies/mL limit of detection (LOD). Two of the ASP POS's were MUC POS (~400 and 20-fold above LOD). For patients with MUC POS BALs, physicians requested on average 6.3 pneumonia-related tests (e.g., ASP PCR, Galactomannan, Legionella PCR, etc.) within 2 weeks of the tested BAL. In total 94.0% (85/91) of these orders yielded NEG results. The MUC PCR was physician-ordered in only one (6.25%) of the MUC POS BALs.

Conclusion. In BAL samples submitted for IA testing, 16 cases (1.5%) had POS MUC PCR. The observed 5:1 (ASP:MUC) ratio approximates published literature on invasive mould incidence. MUC POS concurrent with NEG results for other pathogens suggest potential missed opportunities for MUC early diagnosis and treatment in cases of suspected invasive mould.

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2039. New York State 2016–2018: Progression from *Candida auris* Colonization to Bloodstream Infection

Karen Southwick, MD, MSc[1]; Eleanor H. Adams, MD, MPH[1]; Jane Greenko, RN, MPH, CIC[2]; Belinda Ostrowsky, MD, MPH[3]; Rafael Fernandez, MPH[4]; Rutvik Patel, MSW[1]; Monica Quinn, RN, MS, CIC[5]; Snigdha Vallabhaneni, MD, MPH[6]; Ronald Jean Denis, BS[1]; Richard Erazo, BS[1]; Sudha Chaturvedi, PhD[7]; Valerie B. Haley, PhD[5]; Lynn Leach, MS[7]; Yan Chun Zhu, MS[7]; Rosalie Giardina, BS[8]; Emily C. Lutterloh, MD, MPH[5] and Debra S. Blog, MD, MPH[9]; [1]Healthcare Epidemiology and Infection Control, New York State Department of Health, New Rochelle, New York, [2]Healthcare Epidemiology and Infection Control, New York State Department of Health, Central Islip, New York, [3]Dhqp, Centers for Disease Control and Prevention, New York, New York, [4]Healthcare Epidemiology and Infection Control, New York State Department of Health, New York, New York, [5]Bureau of Healthcare-Associated Infections, New York State Department of Health, Albany, New York, [6]Mycotic Diseases Branch, Centers for Disease Control and Prevention, Atlanta, Georgia, [7]Wadsworth Center, New York State Department of Health, Albany, New York, [8]New York State Department of Health, Albany, New York, [9]Division of Epidemiology, New York State Department of Health, Albany, New York

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Background. New York State (NYS) is experiencing a continuing outbreak of *Candida auris*, first identified in 2016. Patients who are colonized asymptomatically with *C. auris* can progress to bloodstream infection (BSI).

Methods. Colonized patients with positive nares or axilla/groin *C. auris* cultures were followed prospectively. Laboratories, hospitals and skilled nursing facilities reported *C. auris* clinical infections to the NYS Department of Health. Patient demographics, clinical history, hospital admission, procedures, and outcomes data were obtained using a standardized case report form. Patient-days were determined from date of first positive colonization to date of first positive clinical isolate, death, or March 30, 2018, whichever was first.

Results. Between September 28, 2016 and March 30, 2018, 187 *C. auris* colonized patients were identified. Of these, seven progressed to BSI during at least 24,781 patient days of follow-up (median: 98 patient-days, range 0–548 days.) The median time from date of first colonization to date of BSI was 86 days (range 3–310 days). The median patient age at time of colonization was 71 years (range 57–89 years). Between colonization and BSI, patients had a median of five admissions in healthcare facilities (range 1–12). All patients had central neurologic disease, gastrostomy tubes, chronic wounds, and vascular lines at time of BSI. All patients had a positive culture for one or more other multi-drug resistant organism within 90 days of a positive *C. auris* culture, and all received antibiotics in the 30 days before BSI. Six (86%) patients received mechanical ventilation and had tracheostomies. Five (71%) patients had diabetes. Four (57%) had vascular lines replaced in the 30 days before BSI onset. Two (29%) cases had gastrostomy tube replacement between colonization and BSI. One patient died a week after *C. auris* BSI; a second died 4 months later.

Conclusion. In NYS, 4% of *C. auris* colonized patients developed BSI, a rate of 0.3 BSI per 1,000 patient-days. BSI patients have portals of entry such as indwelling medical devices and wounds. Neurologic disease and diabetes may be risk factors for

BSI. Meticulous aseptic technique for invasive procedures, device and wound care may help prevent *C. auris* BSI in colonized patients.

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

2040. Clinical Application of *Aspergillus* Lateral Flow Device (*Asp*LFD) in Bronchoalveolar Lavage (BAL) Fluid of Patients with Classic Risk Factors for Invasive Pulmonary Aspergillosis (IPA)

Kathleen A. Linder, MD[1]; Shiwei Zhou, MD[1]; Carol A. Kauffman, MD[2] and Marisa H. Miceli, MD[1]; [1]Division of Infectious Diseases, Department of Internal Medicine, University of Michigan, Ann Arbor, Michigan, [2]Division of Infectious Diseases, Department of Internal Medicine, University of Michigan and Ann Arbor VA Healthcare System, Ann Arbor, Michigan

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Background. IPA causes high morbidity and mortality in immunocompromised patients, but diagnosis remains challenging. A newly formatted *Asp*LFD targets specific *Aspergillus* antigen JF5, but reported results for this test are variable. We evaluated the performance characteristics of this new *Asp*LFD in BAL fluid of patients with IPA.

Methods. Samples tested were from patients with classic risk factors for IPA defined by EORTC/MSG criteria and that had been prospectively banked in our BAL repository. Each case of IPA identified was matched to two high-risk control patientst without IPA or other invasive fungal infection. Samples were thawed, vortexed, centrifuged, and 100 μL of supernatant was applied to the *Asp*LFD. Results were interpreted at 15 minutes as +, ++, +++, or negative by three independent, blinded observers. Test characteristics, including sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) were calculated.

Results. Samples from 14 patients with proven/probable IPA by EORTC/MSG criteria and 28 control patients without IPA were tested. Median age was 58 (range 22–87); 28 were men. Age and gender distribution were similar between cases and controls. Among IPA cases, 9 were on T cell depleting agents, 4 on high-dose steroids, and 3 had prolonged neutropenia. Among non-IPA controls, risk factors were T-cell depleting agents (17), high-dose steroids (11), and stem cell transplant (2). Of the 14 patients with IPA, *Asp*LFD was positive in 3, negative in 9; in 2, the internal control line did not display and these were considered invalid. Of 6 patients receiving an azole, three had a positive *Asp*LFD test. *Asp*LFD was negative for all 28 BAL in the non-IPA group. *Asp*LFD showed low sensitivity (25%) and high specificity (100%); PPV was 100% and NPV was 75%. Accuracy of the test was 77.5%.

Conclusion. A positive *Asp*LFD test in BAL of patients with classic risk factors for IPA could be useful for ruling in proven/probable IPA because of its high specificity. However, the use of *Asp*LFD as a screening test for IPA is limited by its poor sensitivity.

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

2041. Impact of T2 *Candida* Panel on Species Specific Anti-fungal De-escalation

Zohra Chaudhry, MD[1]; Amit Vahia, MD, MPH[1]; Sally Askar, MPH[2]; Noman Hussain, MD[1]; Mujtaba Hameed, BS*[1] and George Alangaden, MD, FIDSA[1]; [1]Infectious Disease, Henry Ford Hospital, Detroit, Michigan, [2]Central Michigan University College of Medicine, Mount Pleasant, Michigan

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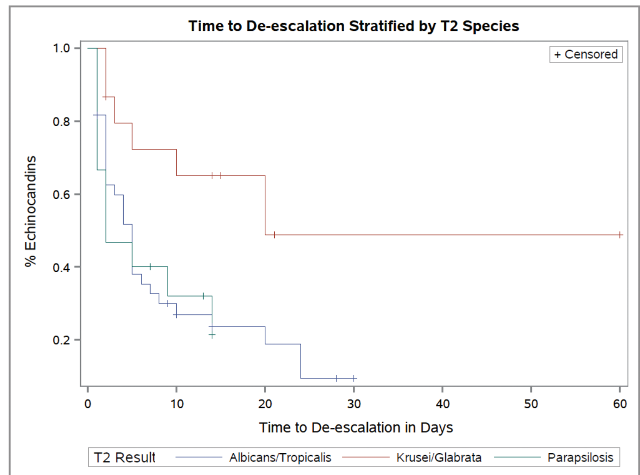
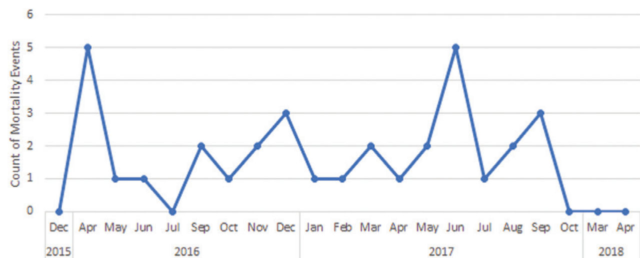
Background. Empiric antifungal treatment is recommended in patients with suspected candidemia given the 20–40% associated mortality. T2Candida Panel (T2) is approved for the rapid detection directly on a blood sample of candidemia caused by *C. albicans/C. tropicalis (CA/CT)*, *C. parapsilosis (CP)*, *C. glabrata/C. krusei (CG/CK)*. Our hospital implemented a candidemia management protocol utilizing T2 to identify candidemia in high-risk patients. We examine the potential for antifungal stewardship by analyzing T2 species-specific result-based antifungal de-escalation.

Methods. Retrospective analyses were conducted on 70 T2-positive patients identified in 2016–2017 at our hospital. The primary endpoint is time to de-escalation from echinocandin to fluconazole based on T2 species identified. Secondary endpoints included time to T2 positivity, and identification of risk factors for mortality. Univariate logistic regression was used to determine association between risk factors and mortality. Multivariate logistic regression models were created using forward selection to model the odds of mortality. Time to de-escalation of echinocandins was modeled using Kaplan–Meier estimators.

Results. In T2-positive results for *CA/CT* or *CP*, 50% of patients were de-escalated to fluconazole therapy within 96 hours. In T2-positive result for *CG/CK*, *50%* of patients were de-escalated in 20 days (figure). The turnaround time (TAT) for T2 6 hours (3–12 hours). Overall mortality was 47% in the T2-positive cohort and was unchanged over the study period. Univariate analysis showed statistically significant associations between mortality and sepsis diagnosis, hypotension, abnormal WBC count, and tachycardia ($P < 0.05$). Multivariate analysis showed tachycardia, age, and presence of prosthetic devices, taken together, fit the best model to predict odds of mortality ($P < 0.05$).

Conclusion. T2 proved useful in promoting de-escalation of echinocandin to fluconazole therapy in patients with fluconazole-susceptible *Candida* species. The rapid TAT of T2 promotes timely de-escalation of enchinocandins. Overall mortality in patients with suspected candidemia remains unaffected despite rapid diagnostics and early empiric antifungal therapy.





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2042. Clinical Application of *Asp*ID PCR Alone and in Combination with *Aspergillus* Lateral Flow Device (*Asp*LFD) in Bronchoalveolar Lavage (BAL) Fluid of Patients with Classic Risk Factors for Invasive Pulmonary Aspergillosis (IPA)

Kathleen A. Linder, MD[1]; Melanie Flaherty, BA[2]; Shiwei Zhou, MD[1]; Jose A. Diaz, MD[2]; Carol A. Kauffman, MD[3] and Marisa H. Miceli, MD[1]; [1]Division of Infectious Diseases, Department of Internal Medicine, University of Michigan, Ann Arbor, Michigan, [2]Section of Vascular Surgery, Department of Surgery, University of Michigan, Ann Arbor, Michigan, [3]Division of Infectious Diseases, Department of Internal Medicine, University of Michigan and Ann Arbor VA Healthcare System, Ann Arbor, Michigan

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Background. Early diagnosis of IPA is challenging and has a direct impact on mortality. Several diagnostic modalities have been developed with variable performance. *Asp*ID is a new multiplex *Aspergillus* qRT-PCR assay and *Asp*LFD is a rapid test that targets the *Aspergillus* specific antigen JF5; both tests were developed by OLM Diagnostics. We evaluated the performance characteristics of *Asp*ID used alone and in combination with *Asp*LFD on BAL fluid of patients at high risk for IPA.

Methods. Samples had been prospectively banked in our BAL repository. Forty-two samples, 14 from patients with proven/probable IPA by EORTC/MSG criteria and 28 from control patients without IPA, were tested with *Asp*ID and *Asp*LFD. For *Asp*ID, DNA extraction and qRT-PCR were performed per manufacturer instructions. For *Asp*LFD, 100 μL of sample was applied to the device. *Asp*ID and *Asp*LFD results were each read by three different blinded observers. Only patient with a valid result for both tests were included in the analysis. Sensitivity, specificity, and accuracy of *Asp*ID alone and in combination with *Asp*LFD were calculated.

Results. Of the 42 samples, 22 were excluded because the *Asp*ID internal extraction control showed the assay to be invalid and one sample was excluded because the *Asp*LFD internal control line was not visible. Thus, 19 patients were analyzed, eight with IPA and 11 without IPA. Among eight IPA cases, seven were positive by *Asp*ID and one was negative; two tested positive by *Asp*LFD and six were negative. Of the 11 control patients without IPA, four were positive by *Asp*ID and seven were negative; all 11 were negative by *Asp*LFD. *Asp*ID sensitivity was significantly higher than that of *Asp*LFD (87.5% vs. 25%, $P = .0001$), but specificity of *Asp*LFD was superior to that of *Asp*ID (100% vs. 64%, $P = 0.049$). Accuracy was 74% for *Asp*ID and 68% for *Asp*LFD. When deciding whether doing both tests was beneficial for diagnosis, union analysis showed the sensitivity to be 87.5% and the specificity to be 64%. Accuracy was not improved and remained at 74%.