#320 Clinical Impact of Plasma Metagenomics Next-Generation Sequencing in a Large Cohort

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Background

Plasma metagenomics next-generation sequencing (mNGS) is an emerging diagnostic tool with limited literature on effective clinical implementation. **Here, we describe the clinical use and implications of plasma mNGS in the largest cohort to date.**
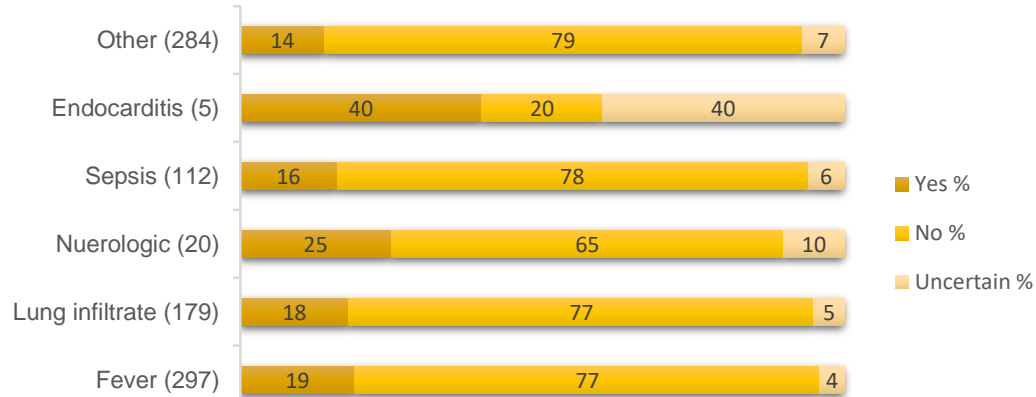
Methods

Collect plasma mNGS test at UMMC between 2016 – 2021. Record demographics, indications, conventional tests ± 30 days. Assess clinical impact as Yes/No/Uncertain and characterize as new or earlier dx, avoidance of invasive procedure, change to antimicrobials, confirmed clinical dx, unnecessary treatment or additional diagnostics or none.

Results: 570 plasma mNGS cases

31% SOT	**80** died within 30 days
28% HSCT	**39%** <18 yrs
27% Malignancy	**91%** hospitalized
10% Chronic lung disease	**4 days** prior to ordering
	17% > 1 test

Percentage clinical impact by indication

Indication	Yes %	No %	Uncertain %
Other (284)	14	79	7
Endocarditis (5)	40	20	40
Sepsis (112)	16	78	6
Nuerologic (20)	25	65	10
Lung infiltrate (179)	18	77	5
Fever (297)	19	77	4

Percentage clinical impact by underlying condition

Conditions (N)	Yes %	No %	Uncertain %
Prematurity (21)	14	86	0
Malignancy (153)	18	79	3
SOT & HSCT (339)	18	77	5
Chronic lung disease (51)	16	76	8
Rheumatic & Gastrointestinal (38)	21	76	3
Other (281)	15	78	7
None (38)	10	82	8

Accuracy by causative and contaminant organisms

		Conventional		Plasma mNGS	
	N (%)	Mean	Median	Mean	Median
Time to diagnosis(days)			4		3
Infectious cause	255 (46)	77		44	
Contaminants	305 (60)	66		37	

Clinical Impact

- **16% Yes   78% No   6% Uncertain**

- **65 New or earlier Dx** including invasive molds, toxoplasma, pneumocystis, adenovirus, anaerobic infections, nocardia, MAC, MTb, enterocytozoon, leptospira
- **25 Change in antimicrobials**
- **6 Avoidance of invasive diagnostic**
- **202 Negative, no action**
- **109 New organism, no action**

Help guide studies. Take the plasma mNGS use Survey.

Discussion

- Limited at large clinical impact
- Need subgroup analysis of underlying conditions and indication
- Earlier ordering needed

Next Steps:
- Prospective study on invasive fungal infections
- Cost-benefit modeling