Presentations

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Use of Clinical Criteria for Prediction of Invasive Bacterial Infection in Febrile Infants: Evaluation of the PROS Criteria

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Use of Clinical Criteria for Prediction of Invasive Bacterial Infection in Febrile Infants: Evaluation of the PROS Criteria

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PAS 2021 VIRTUAL

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Mentor: Paul Aronson

Disclosure

Lyubina Yankova
Has documented no financial relationships to disclose or Conflicts of Interest (COIs) to resolve.

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Unapproved or Off Label

Lyubina Yankova has documented this presentation ***will not*** involve discussion of unapproved or off-label, experimental or investigational use.

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Background

- Should a primary care doctor obtain lab testing or refer a febrile infant to the ED?
- 2004 AAP Pediatric Research in Office Settings (PROS) network study
  - 3 clinical criteria:
    - Age <25 days
    - Maximum temperature ≥38.6℃
    - Ill-appearance
  - Sensitivity 93.6% for invasive bacterial infection (IBI)
    - Need for external validation

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Objective

To evaluate the sensitivity of the PROS criteria for IBI in febrile infants ≤60 days old

Methods

Study Design:

- Secondary analysis of retrospective cohort study
- Setting: 11 EDs between 7/1/2011 – 6/30/2016

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Methods

Study population:

- Identified by query of each site's microbiology laboratory or EHR system

Inclusion Criteria	Exclusion Criteria
- Age ≤60 days - Temp of ≥38℃ at home or ED triage - Blood or cerebrospinal fluid (CSF) pathogen	- Clinically apparent source of infection

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Methods

Study Definitions:

- Ill-appearing: toxic, limp, unresponsive, gray, cyanotic, apneic, weak cry, poorly perfused, grunting, listless, lethargic, or irritable

- IBI: pathogen identified in blood and/or CSF AND treated as bacteremia or bacterial meningitis

- Bacterial Meningitis:
  - Pathogen in CSF culture
  - CSF pleocytosis with bacteremia if pretreated

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Methods

Outcome Measure:

- Sensitivity of PROS criteria
  - Age <25 days
  - Maximum temperature ≥38.6℃
  - Ill-appearance

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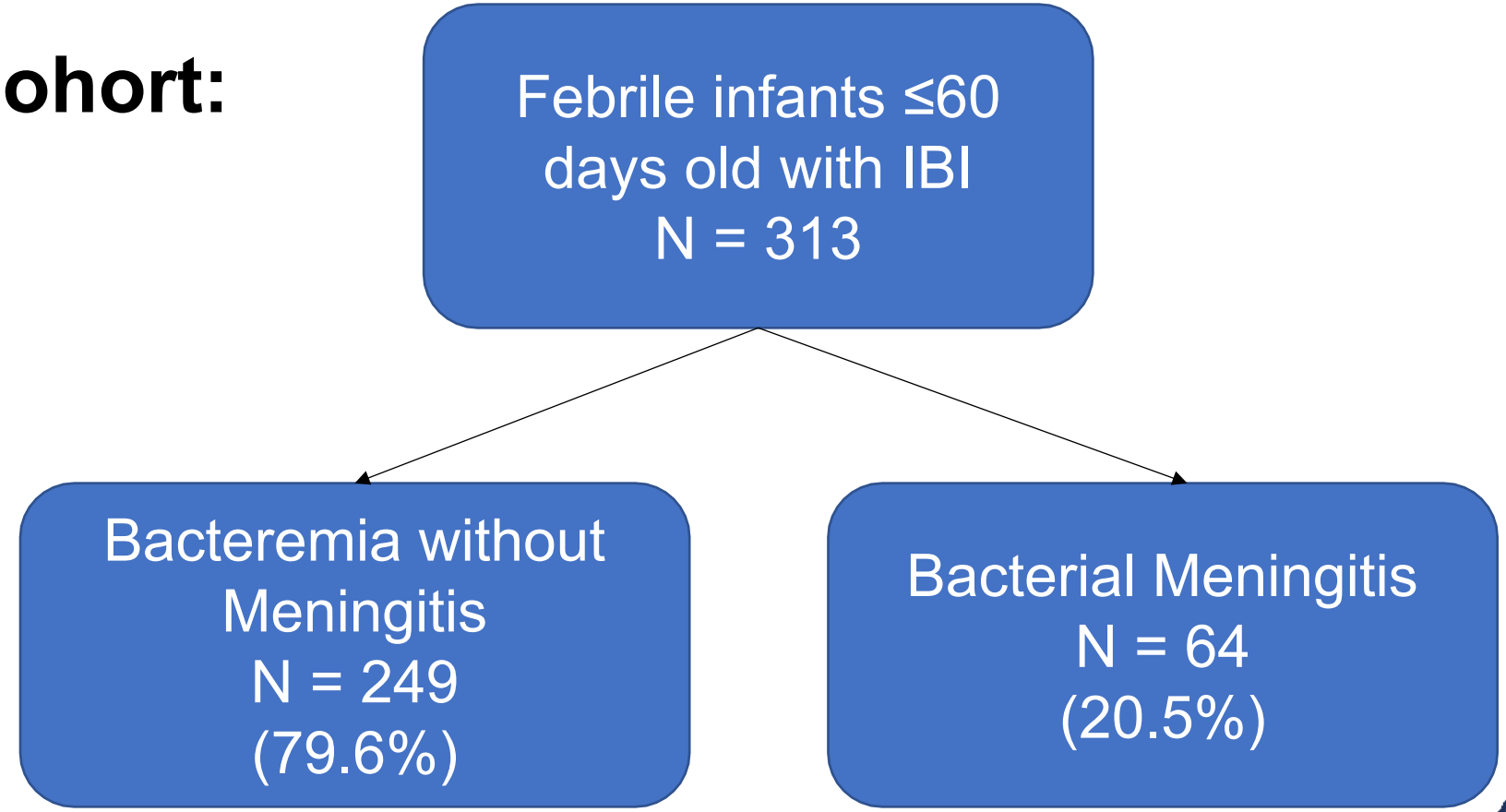
Results

Study Cohort:



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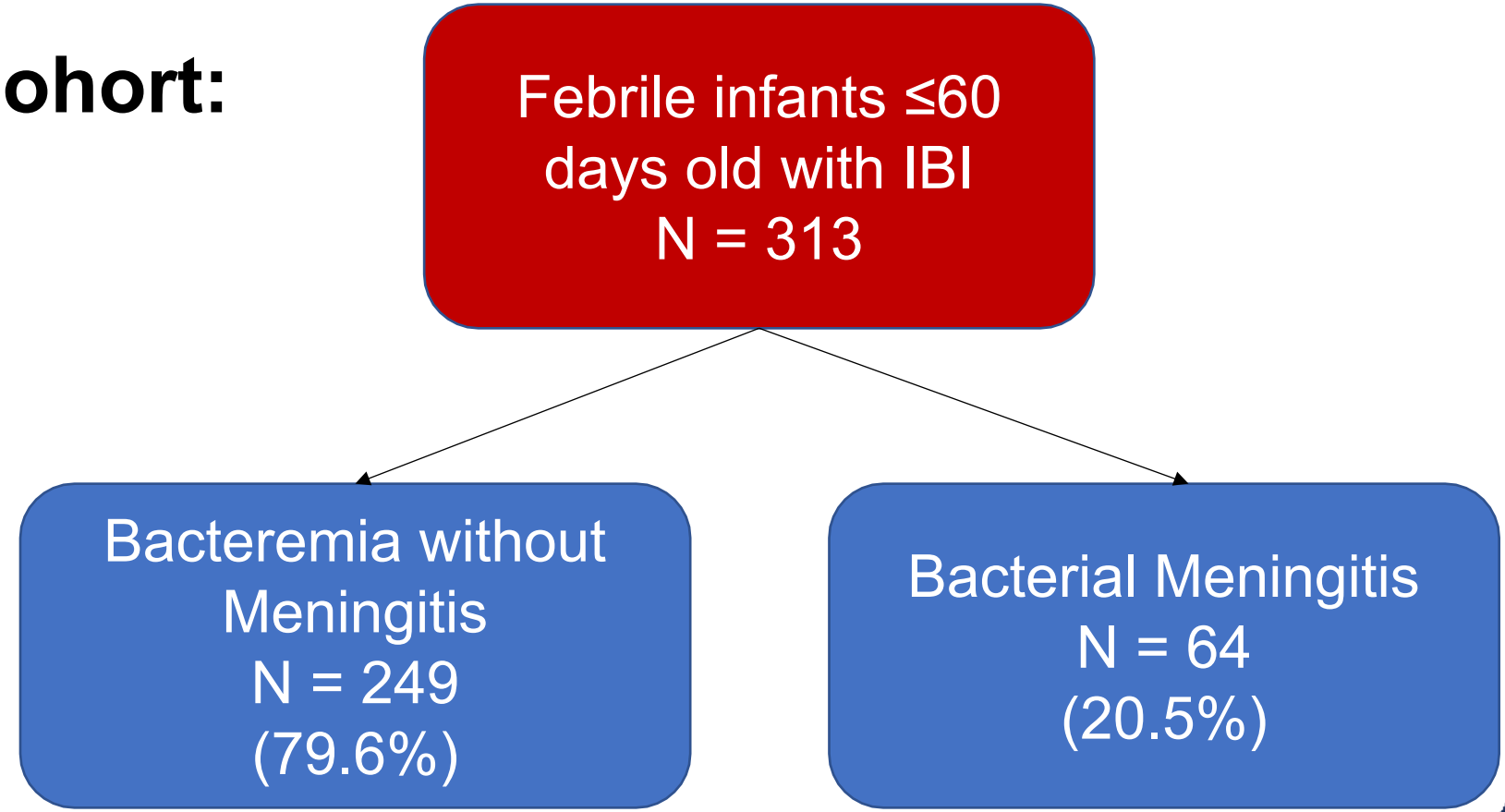

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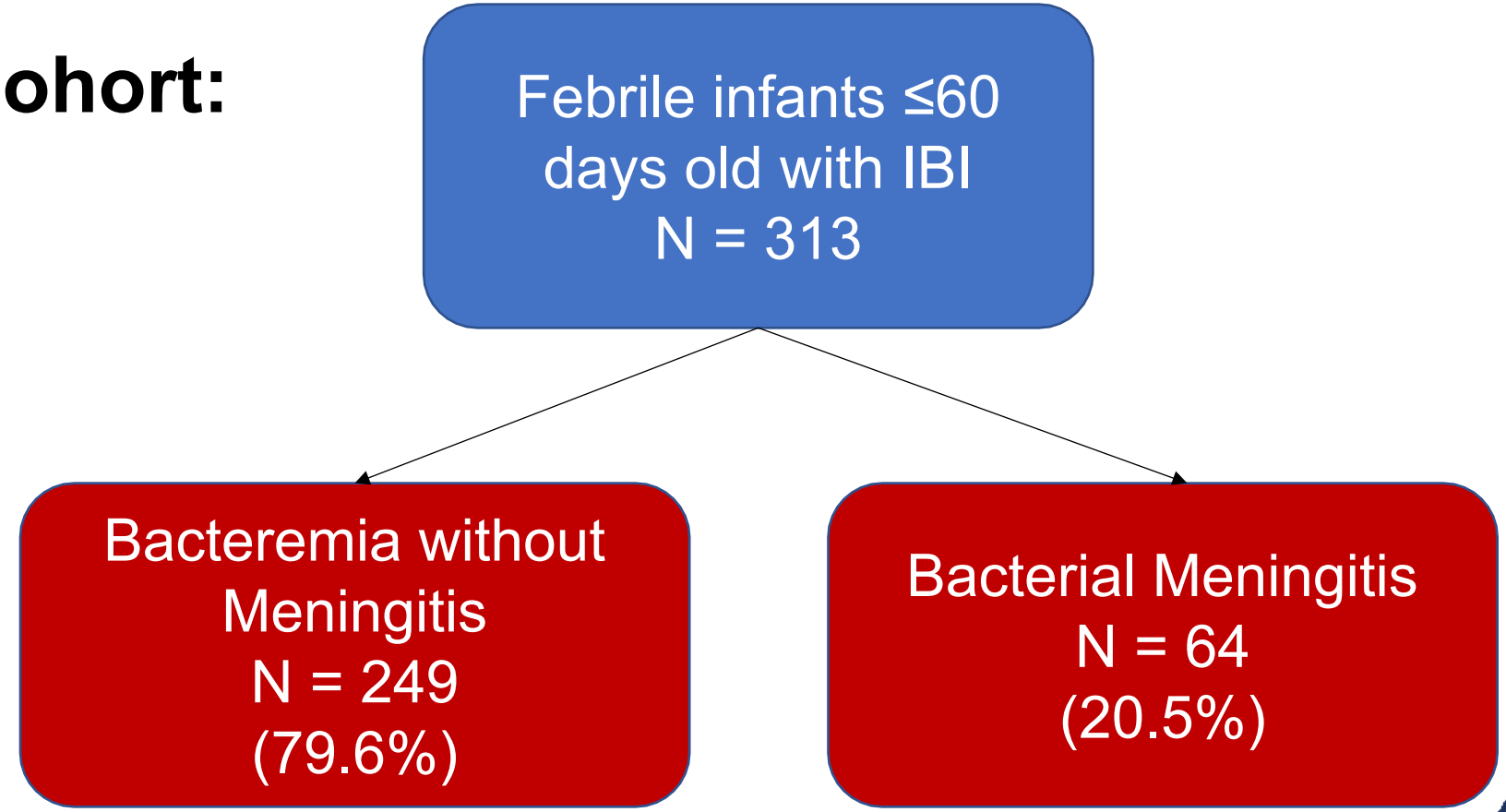

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Results

Study Cohort:

- Age Group:
  - <25 days: 130 (41.5%)
  - 25-60 days: 183 (58.5%)

- Clinical Appearance
  - Ill-appearing: 87 (27.8%)
  - Non-ill-appearing: 226 (72.2%)

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	IBI Overall	Bacteremia Without Meningitis	Bacterial Meningitis
Sensitivity (95% CI)	87.9% (83.7-91.3)	87.1% (82.3-91.0)	90.6% (80.7-96.5)

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Results

Missed IBI:

- 38 infants with IBI (12.1%) misclassified as low-risk
- 6 of these infants had bacterial meningitis

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Results

Age, d	Maximum temperature (℃)	Ill-Appearing Y/N	Peripheral WBC (cells/μL)	CSF WBC (cells/μL)	Blood culture	CSF culture
25	38.4	N	9,670	91	K. pneumoniae	No growth*
25	38.0	N	4,600	820	S. gallolyticus	S. gallolyticus
26	38.3	N	11,450	Not performed	No growth	E. coli
36	38.2	N	5,630	3	GBS	GBS
39	38.3	N	14,800	102	E. coli	No growth*
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*CSF culture obtained >11 hours after antimicrobial administration; treated as bacterial meningitis

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Limitations

- Outpatient criteria applied to ED cohort
- Retrospective determination of “ill-appearance”
- Cannot calculate specificity or predictive values

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Conclusions

- Sensitivity of PROS criteria for identifying febrile infants at low-risk for IBI was lower in our study (87.9%) than in original study (93.6%)
- Caution in applying PROS criteria

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Future Directions

- Derive and validate clinical criteria for use when laboratory testing unavailable
- Evaluate outcomes of infants managed without laboratory tests

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Acknowledgements

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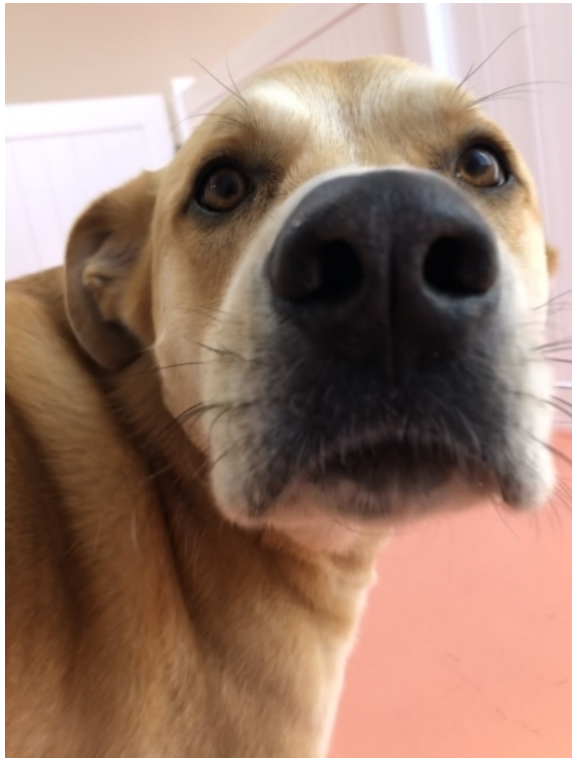
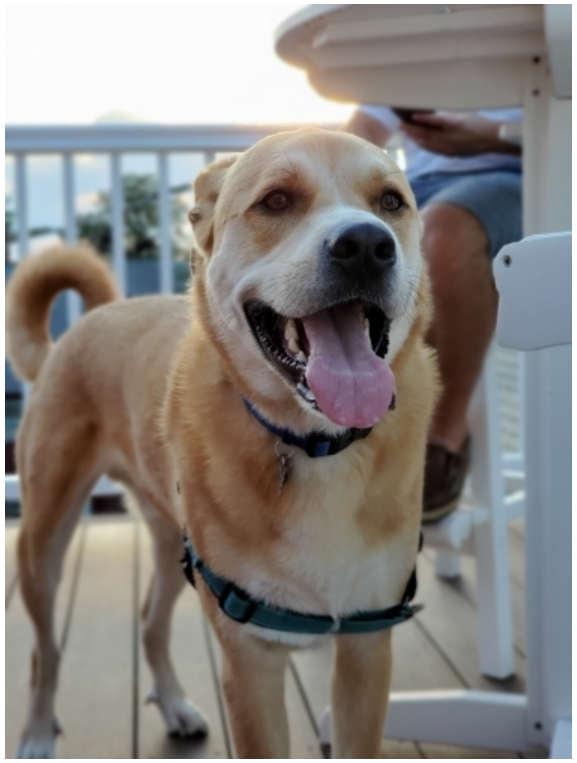
Questions?

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