Burnin' Up: Fever in young children

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Cases

A 42-day-old ex-full term infant presents with fever to 101 for 36 hours. Exam significant for fever, tachycardia, and rhinorrhea.

A 16-month-old presents with fever to 101 for 2 days, with 2 episodes of emesis. Exam significant for fever, tachycardia, and rhinorrhea.

A 4-year-old presents with fever to 101 for 6 days straight. Exam significant for fever, tachycardia, and rhinorrhea.

Take-aways

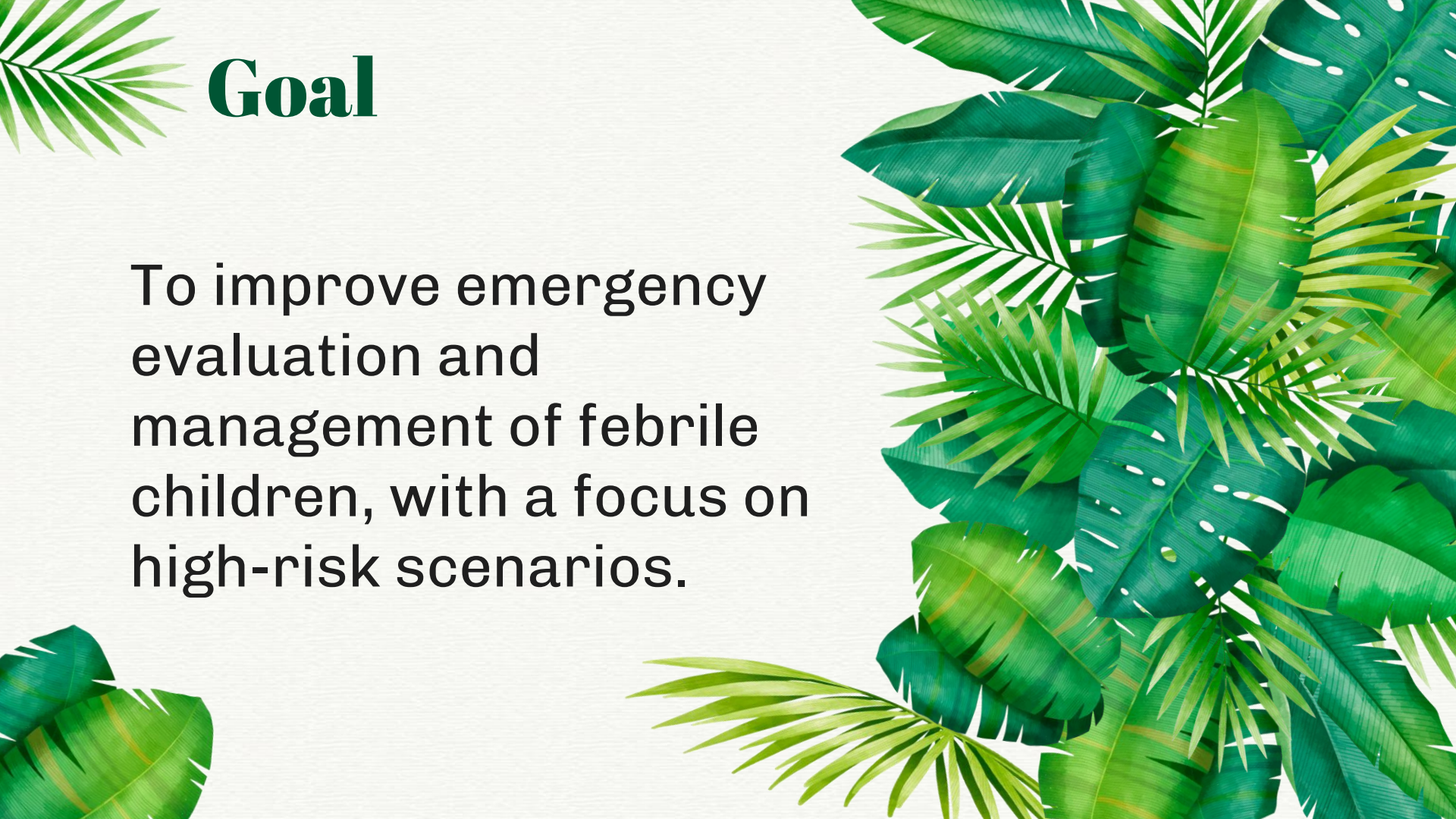
Neonates are not to be trusted.

One ~~ring~~ test to rule them all... doesn't exist.

Chill, have a snack, and keep your nose clean.

Goal

To improve emergency evaluation and management of febrile children, with a focus on high-risk scenarios.



Objectives

After attending this session, learners will be able to:

- List common and life-threatening infections present in this age group.
- Describe an evidence-based approach to laboratory testing for infants 60 days and younger.
- Explain critical components of management of the febrile child, including decisions about disposition.

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(Still) **no commercial or financial interests to disclose.**

Why does this matter?

Why this matters

- Fever: 10-30% of pedi ED visits
- High morbidity
- Highest risk:
  - **Very young infants (< 60 days)**
  - Immunocompromised children
  - Children with chronic medical conditions
  - *Un(der)vaccinated*

Take-aways

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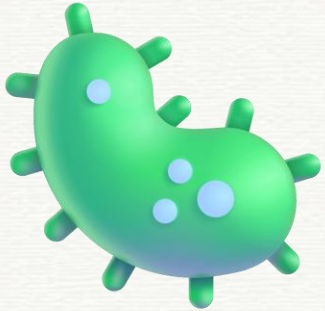
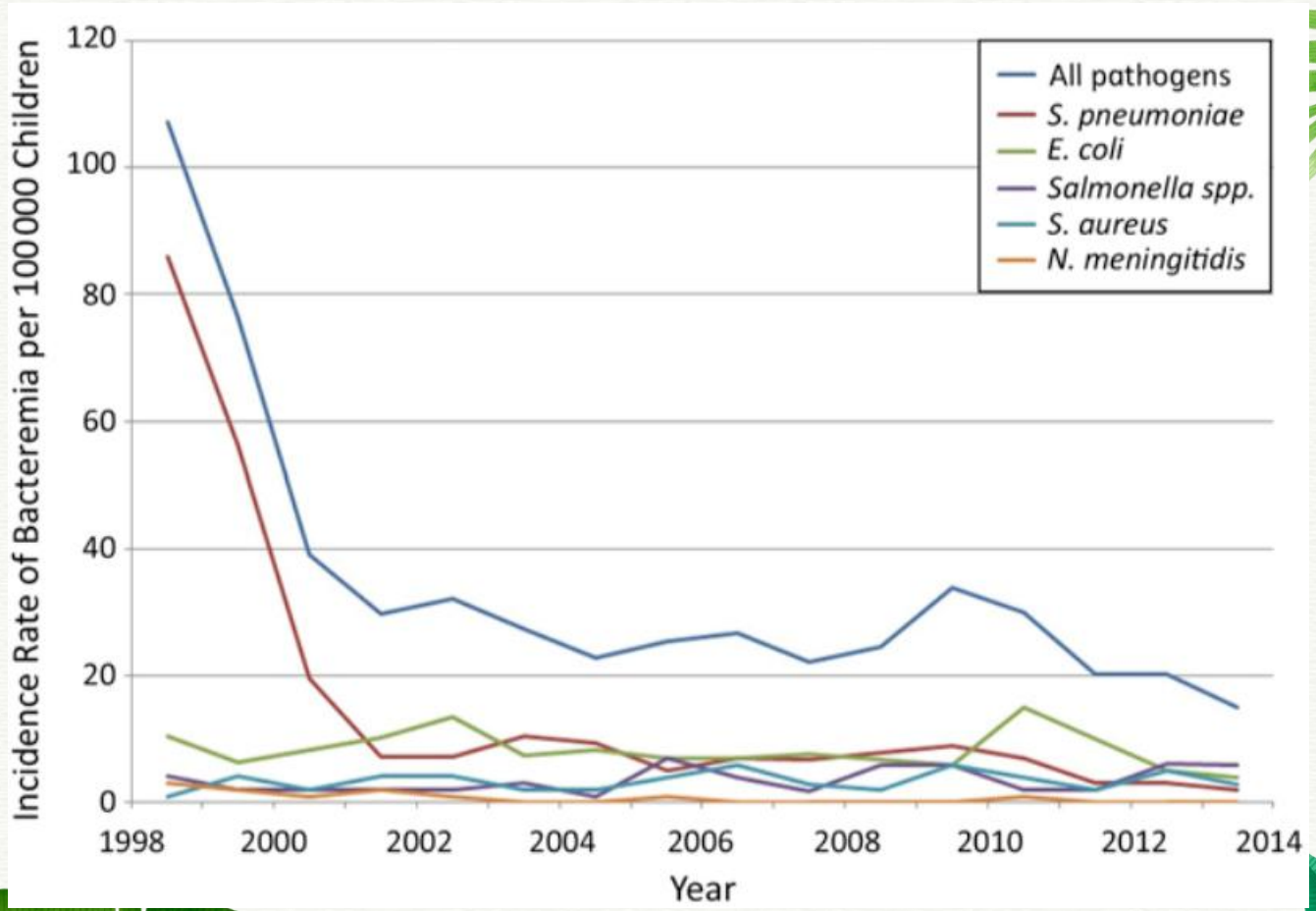
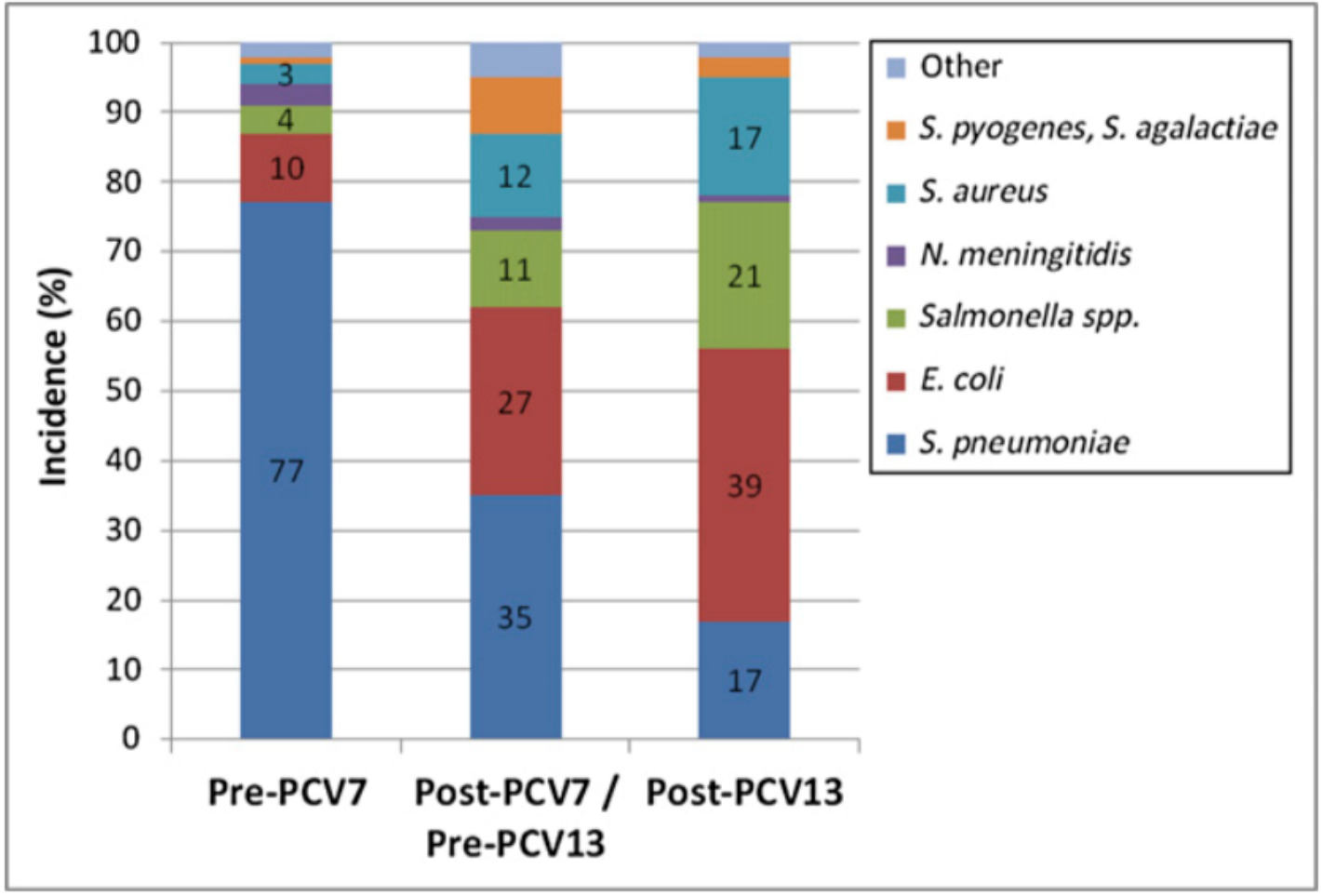
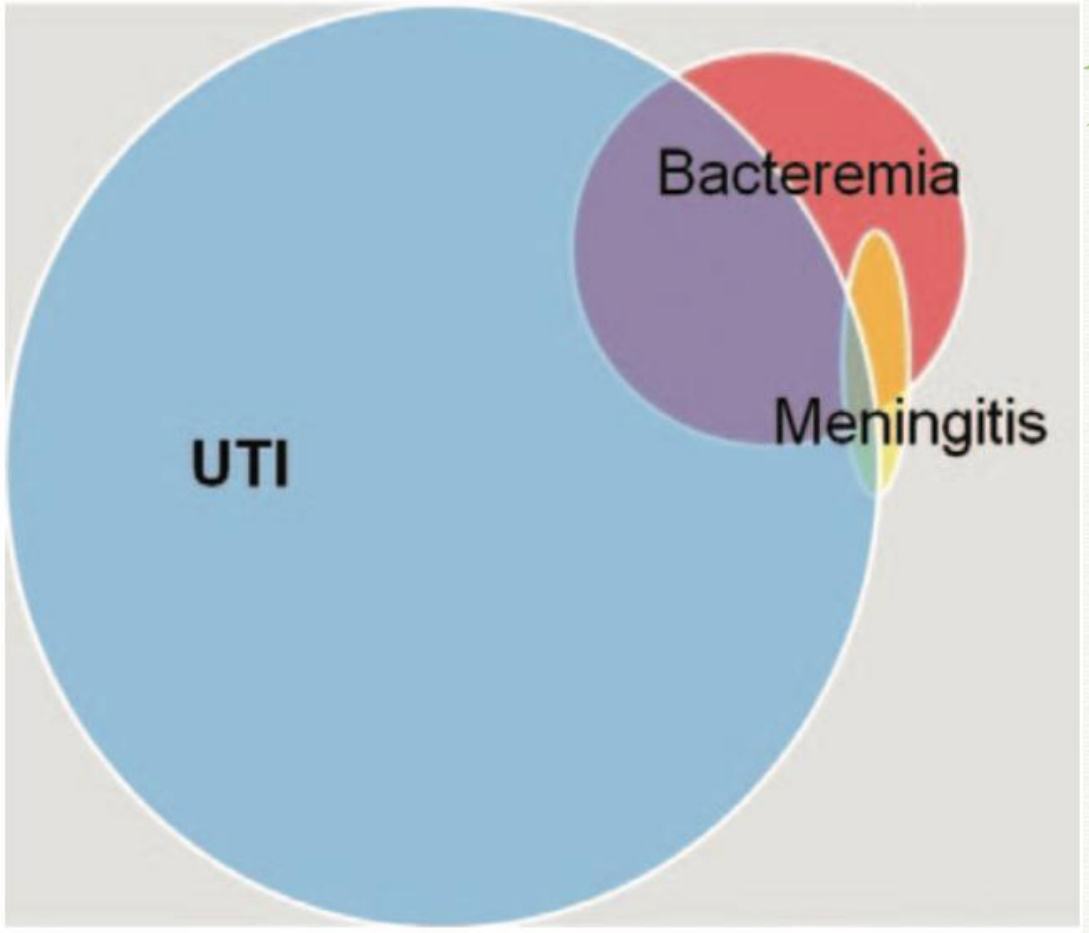
Infections

- Viral infections!
  - Upper respiratory infection (URI)
  - Acute gastroenteritis
  - Exanthems, including gingivostomatitis
  - Croup
  - Bronchiolitis
  - Covid
- Urinary tract infection (UTI)
- Acute otitis media
- Pneumonia
- **Invasive bacterial illness (IBI)**
  - Bacteremia, meningitis




Incidence Rate of Bacteremia per 100 000 Children
120
100
80
60
40
20
0
1998
2000
2002
2004
2006
2008
2010
2012
2014
Year
All pathogens
S. pneumoniae
E. coli
Salmonella spp.
S. aureus
N. meningitidis


Incidence (%)
100
90
80
70
60
50
40
30
20
10
0
77
10
4
3
35
27
11
12
17
39
21
17
Pre-PCV7
Post-PCV7 / Pre-PCV13
Post-PCV13
Other
S. pyogenes, S. agalactiae
S. aureus
N. meningitidis
Salmonella spp.
E. coli
S. pneumoniae


Bacteremia
Meningitis
UTI

AAP Guidelines

(Very) Young Infants

Neonate: 0-28 days

- *Very* high risk!
- Septic workup:
  - Blood culture, cath urinalysis and urine culture
  - Lumbar puncture with CSF culture, gram stain, cell count with diff, glucose, protein, *viral PCR studies*
  - *Consider inflammatory markers*
- Parenteral antimicrobials
- Hospital admission***

Neonate: 22-28 days

- Let's muddy the waters!
- IF:
  - **Well-appearing, AND**
  - LP performed and normal, AND
  - Family able to closely observe the child at home, AND
  - Follow-up in 12-24 hours, THEN
- Can ***consider*** observation at home **without** antimicrobials

Take-aways

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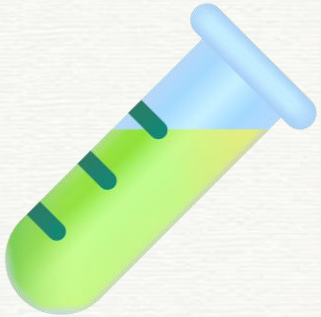
Inflammatory markers (IMs)

- **Procalcitonin** *(abnormal > 0.6 ng/mL)*
- Absolute neutrophil count *(abnormal > 4000-5200/mm^3)*
- C-reactive protein *(abnormal > 20 mg/L)*
- If no procalcitonin:
  - ANC + CRP + temperature *(abnormal > 38.5C)*



Take-aways

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Infants 29-60 days

- Cath urinalysis and urine culture
- Blood culture
- IMs
- *Consider respiratory viral testing*

Infants 29-60 days

- IMs **normal**:
  - UA **negative**: no further testing, DC home without antimicrobials
  - UA **positive**: no further testing, DC home on oral antimicrobials
- IMs **abnormal**:
  - UA **negative**: *consider LP*, consider hospital admission without antimicrobials
  - UA **positive**: strongly consider LP, oral or parenteral antimicrobials, strongly consider admission


Whew!

Bigger kids

- Lower risk!
- H&P more reliable
  - History:
    - Hydration, energy, associated symptoms, sick contacts, prior infections
  - Exam:
    - Ears, mouth, lungs, skin

Bigger kids

- Consider **urinalysis + culture**:
  - Fever ≥ 39
  - No suspected alternative source
  - Fever + emesis alone
  - Symptomatic
  - Fever ≥ 3 days
- Consider **Covid testing, +/- influenza**
- Clear expected course and return precautions

Urine collection

- Infants:
  - **Cath** in most instanc
    - Bag if looking for
    - Can also do **bladd**
- Potty-trained:
  - Clean catch
- In between:
  - Ask caregiver about
  - If no symptoms or h
  - If moderate pretest

Prolonged fever

- ***Really good*** history
- Differential diagnosis:
  - **Prolonged or successive viral illness(es)**
  - Pneumonia
  - Kawasaki disease
  - Leukemia or other malignancy
  - *Occult bacteremia*
  - Osteomyelitis, perinephric abscess, diskitis, etc
- Workup:
  - Possibly chest X-ray
  - Consider: Blood culture, CBC with diff, PCT, ESR/CRP, bag UA, *viral testing*
- **Don't need a diagnosis!**

Management

Management

Rectal ter

sal suction

Discharge criteria

- Oral challenge
- Reliable phone and transportation
- Caregiver willing and able to observe patient and communicate changes
- Access to follow-up care

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Bonus round!

A 20-day-old presents with fever for one day, rhinorrhea, and congestion. All 3 sibs have URIs. The infant looks GREAT, with congestion and rhinorrhea on exam only. **What do we do?**

Objectives

Now, we can:

- List common and life-threatening infections present in this age group.
- Describe an evidence-based approach to laboratory testing for infants 60 days and younger.
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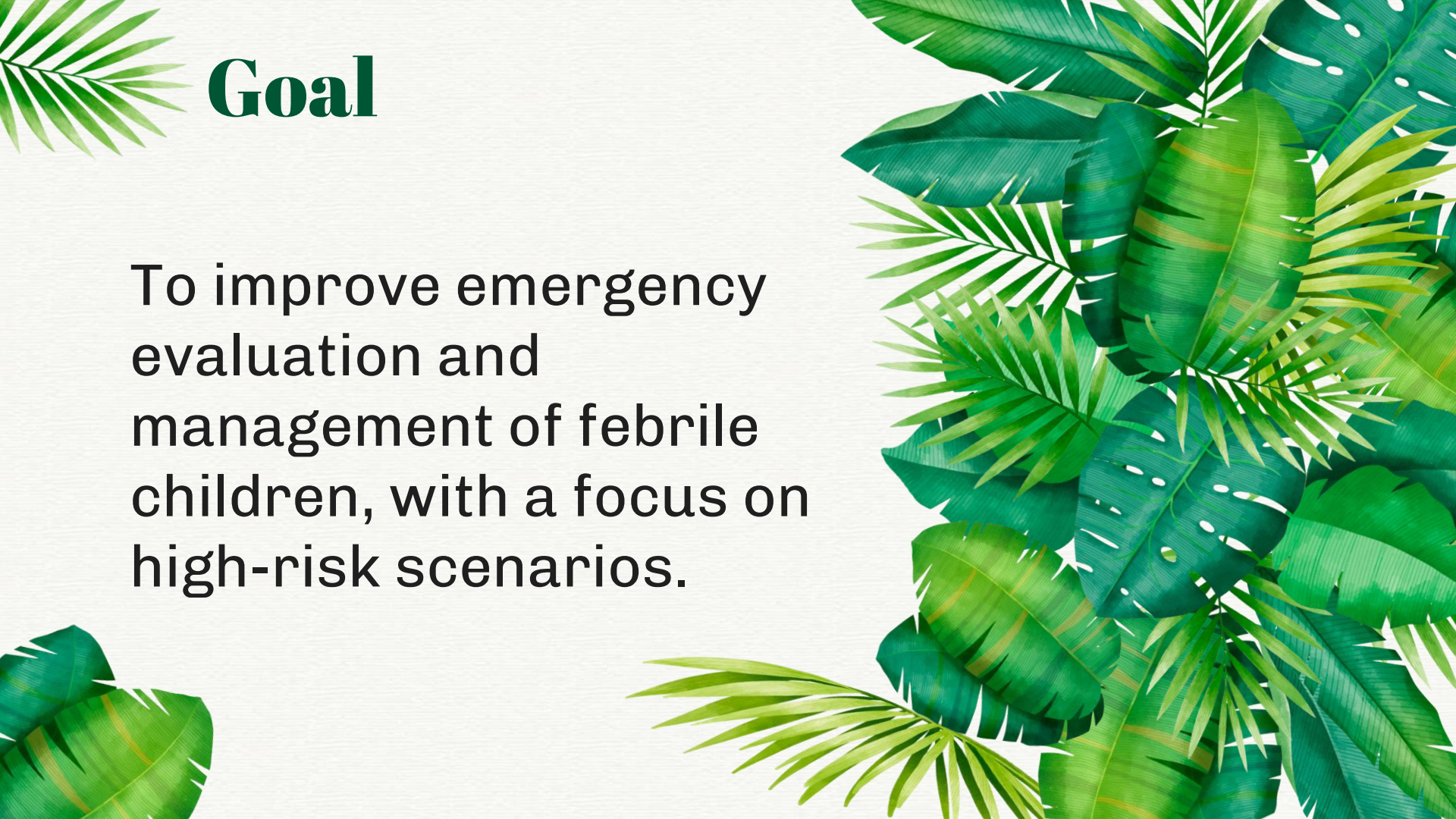

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Thank you!

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