

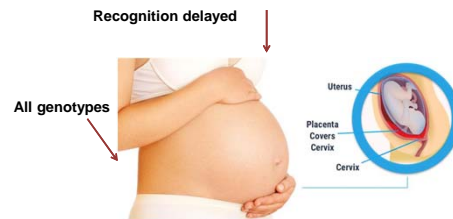
A Focus on HCV Perinatal Transmission and Exposed Infants

2018 Viral Hepatitis Conference
Ending the Epidemic

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Associate Professor of Pediatrics
Pediatric Infectious Diseases
July 31, 2018



Perinatal Transmission



Espinosa et al. Clin Therapeutic, In press

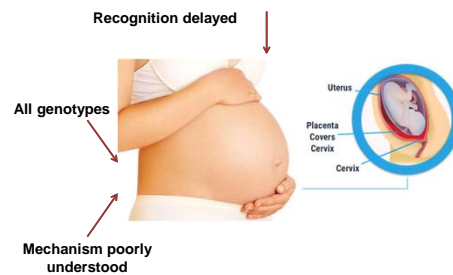


Disclosures

- I have received grant support from Gilead – FOCUS grant
- I am a local principal investigator (PI) for multiple industry sponsored trials including Gilead, Merck, Cemptra, Regeneron, and Cubist among others.
- I am part of AstraZeneca's Speaker Bureau.



Perinatal Transmission



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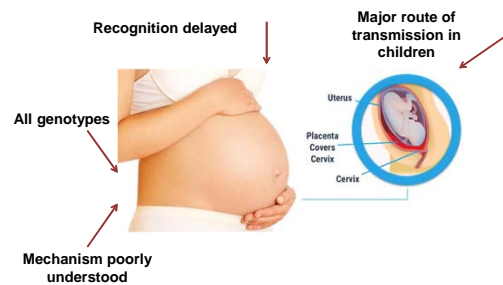
Perinatal Transmission



Espinosa et al. Clin Therapeutic, In press



Perinatal Transmission



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Perinatal Transmission

Recognition delayed

Major route of transmission in children

All genotypes

Mechanism poorly understood

Occurs only if mother is viremic

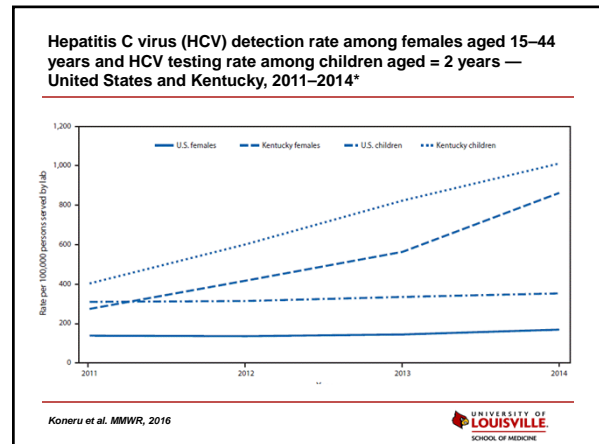
Uterus

Placenta Covers Cervix

Cervix

Espinosa et al. *Clin Therapeutic*, In press

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Perinatal Transmission

Recognition delayed

Major route of transmission in children

All genotypes

Mechanism poorly understood

Rate of transmission is low

Occurs only if mother is viremic

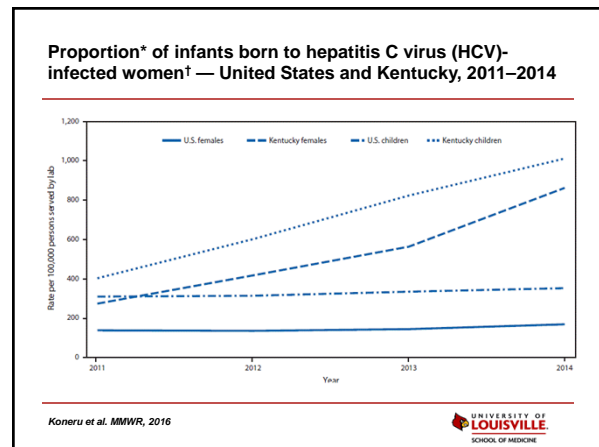
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Post-Tribune

Indiana HIV outbreak, hepatitis C epidemic sparks CDC alert

RESULTS IN 30 MINUTES

FREE HIV TESTING MONDAYS AND THURSDAYS 10:00 AM - 3:00 PM 100 Harrison Street, Scottsburg, IN 47170 812-534-0300

HIGH RISK BEHAVIORS SHOULD BE TESTED*

*Injection Drug Use/ Sharing Needles other high risk behaviors

By Tribune wire reports - Contact Reporter

<https://communityaccessnationalnetwork.wordpress.com/2015/04/08/scott-county-the-case-for-needle-exchange/>

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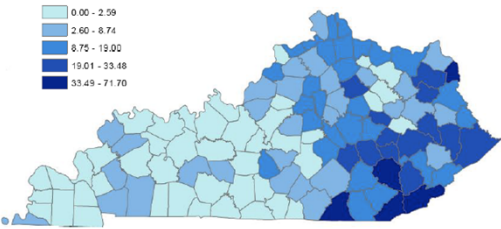
Kentucky Surveillance, 2014-2017

- KY Viral Hepatitis Prevention Program
 - 2013, voluntary reporting of HCV positive pregnant women, their infants, and children < 5 yr
 - 2015 (Feb), mandatory reporting
 - 2017 (May), expansion of harm reduction efforts
 - 47 operational syringe exchange programs
 - 5 additional sites approved

Wilburn et al. CSTE poster presentation

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Rate of HCV Infection Among Pregnant/Post-partum Women per 1000 (live births, by county – KY 2014-2016)



Wilburn et al. CSTE poster presentation



Kentucky Surveillance, 2014-2017

Age <18 months				
Ab +	9	16	58	83
Ab -	0	3	3	6
No Ab	14	28	722	764
Total	22	47	783	852

AB 89/852 (10%)

Age ≥ 18 months				
Ab +	11	4	24	39
Ab -	0	1	8	9
No Ab	6	5	34	45
Total	17	10	66	93

AB 48/93 (52%)

Wilburn et al. CSTE poster presentation



Kentucky Surveillance, 2014-2017

Mothers or Pregnant Women		
Age Group	n=2,243	%
14-20	99	4.4
21-24	465	20.7
25-29	780	34.8
30-34	430	19.2
35-39	154	6.9
40+	31	1.4
Unknown	284	12.7

RNA + 410/490 (86%)
RNA - 80/490
NO RNA 1753/2243 (78%)

Wilburn et al. CSTE poster presentation



Kentucky Surveillance, 2014-2017

- Rate of HCV infection among pregnant women and new mothers was
 - 10.6 per 1,000 live births per KVHPP
 - 19.3 per 1,000 live births per birth certificate data
- Great variability across counties
- Legislation changes to take effect in July 2018

Wilburn et al. CSTE poster presentation



Kentucky Surveillance, 2014-2017

Children		
Age Group	n=946	%
<12 months	825	87.2
≥12 months	121	12.8

Wilburn et al. CSTE poster presentation



Testing for HCV Exposed Infants

- Need to follow up children
 - Follow up barriers
 - Ownership of follow up
 - Age of testing
 - Partnership with OB-GYN
 - Partnership with neonatologists
 - Partnership with other specialists GI, ID, etc
 - Unique challenges
- ➔ Development of protocol

Wilburn et al. CSTE poster presentation



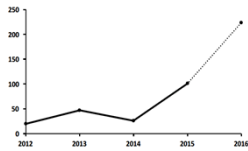
Protocol

- Risk factors present → screen mother
 - If mother not available screen baby
- Antibody positive
 - Screen for other perinatally transmitted diseases
 - Baby to follow up in PID clinic
 - HCV PCR RNA at 2-4 months
 - HCV antibody at 18 months

HCV Antibody Positive Mothers 2012-2016	N = 225(%)
Age mean years, [IQR Q1-Q3]	27 [IQR 24 - 30]
Ethnicity	
White	196 (87%)
Black	16 (7%)
Other	13 (6%)

A Year Later

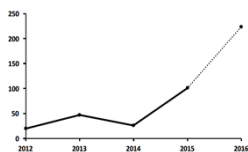
Pediatric Infectious Diseases
Clinic Visits of HCV Perinatally
Exposed Children – Expected



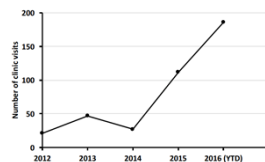
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Parity	
One	61 (30%)
Two	37 (18%)
Three or more	104 (52%)

A Year Later

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Pediatric Infectious Diseases
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Risk Factors	
Current or past history of IVDU	175 (86%)
Other risk factors (tattooing, jail, etc)	20 (10%)
None	9 (4%)

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Risk Factors	
Current or past history of IVDU	175 (86%)
Other risk factors (tattooing, jail, etc)	20 (10%)
None	9 (4%)
HCV RNA PCR	
Not done or unknown	145 (64%)
Positive	75 (34%)
Negative	5 (2%)

SCHOOL OF MEDICINE

HCV Perinatally Exposed Infants 2012-2016	N = 225(%)
Age mean months, [IQR Q1-Q3]	2 months [2 - 4]
Female	117 (52%)
Gestational age mean, [IQR Q1-Q3]	37 weeks [36 - 39]
NICU stay	162 (72%)
Length of stay (days) mean, [IQR Q1-Q3]	18 days [6 - 28]
NAS	118 (67%)
Foster care or relative	98 (45%)

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Infant's PCR	
Not done	18 (8%)
One	71 (32%)
Two or more	136 (60%)

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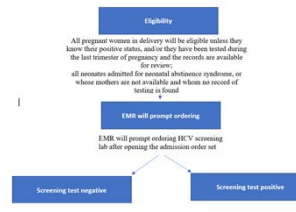
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Two or more	136 (60%)
Infant's RNA PCR positive	8 (3.6%)
Lost to follow up	105 (47%)




Innovative Model

Increasing screening

- **Universal screening of pregnant women & exposed infants**
 - EMR modifications
 - Reflex testing
 - Implementing mandate legislation







Follow up Challenges

Maternal

- Young women
- Multiple pregnancies
- Other kids exposed
- No risk factors identified (4%)
- Confirmatory testing not done or unavailable in 64%

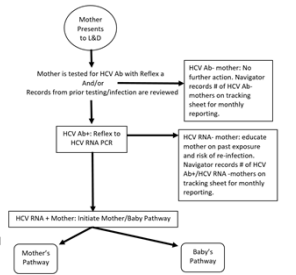





Innovative Model



Linkage to care


- **Dyads**
 - Patient navigator
 - Provider and staff education
 - Patient education
 - Link siblings to care
 - Registries





Follow up Challenges

<p>Maternal</p> <ul style="list-style-type: none"> • Young women • Multiple pregnancies • Other kids exposed • No risk factors identified (4%) • Confirmatory testing not done or unavailable in 64% 	<p>Infant</p> <ul style="list-style-type: none"> • High proportion of NICU admission (72%) • High rate of NAS (67%) • Foster care placement occurs in 45% • PCR not done in 8% • High rate of follow up 
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Propose Algorithm to Screen and Follow HCV Perinatally Exposed Children

