Version date: 9/1/2017

DELIVERY CHECKLIST FOR ZIKA/SUSPECTED ZIKA CASES & ZIKA ASSOCIATED BIRTH DEFECTS
Chicago Dept. of Public Health/Cook County Dept Public Health

Step 1: Determine need for Zika testing
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Step 2: Coordinate post-partum testing
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Step 3: Complete infant assessment and US Zika Registry Form (if mother with evidence of Zika)
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Step 4: Contact local health department

STEP 1: Determine Need for Zika Testing

ASK EVERY PATIENT ABOUT ZIKA EXPOSURE AND TESTING IN TRIAGE! **(See Appendix A)**

A. KNOWN MATERNAL LABORATORY EVIDENCE OF ZIKA:

i. **Prenatal maternal serum** or **urine** RT-PCR positive for Zika
ii. **Prenatal maternal serology** reflects either
(a) IgM positive where the Plaque Reduction Neutralization Test (PRNT) is pending
(b) PRNT result indicates Zika virus infection **OR** undifferentiated flavivirus infection

- INFANT NEEDS TESTING (collect whole blood, urine, serum), with comprehensive physical exam plus ophthalmology consult and head ultrasound.
- If maternal testing indicates undifferentiated flavivirus infection, collect placenta and umbilical cord for possible submission to public health laboratory

B. POSSIBLE MATERNAL ZIKA: **Maternal possible exposure to Zika AND** one of the following:

i. **Mother symptomatic** for Zika virus disease during current pregnancy (fever, rash, conjunctivitis, arthralgia)
ii. Ongoing (daily or weekly) possible Zika exposure and asymptomatic

- MOTHER needs testing (collect whole blood, urine, serum) if not already done.
- INFANT needs comprehensive physical exam; if any concern for possible Zika-related birth defect, test infants (collect whole blood, urine, serum) and obtain ophthalmology consult and head ultrasound. Report all infants with possible Zika-related birth defect to the health department.

C. POSSIBLE ZIKA-RELATED BIRTH DEFECT: Anomaly/birth defect (Appendix C) OR fetal demise

- Assess for Zika exposure (appendix A)
- INFANT needs testing (collect whole blood, urine, serum) with maternal Zika exposure, regardless of prior maternal test result. Infant also needs comprehensive physical exam, newborn hearing screen, ophthalmology consult and head ultrasound.
- Collect placenta and umbilical cord (or fetal tissue) for submission to public health laboratory (unless mother already has laboratory evidence of Zika)
- **Report ALL cases to IDPH** (**Appendix C**), regardless of Zika exposure or test history

STEP 2: Coordinate Post- Partum Testing: CONTACT PEDS, PATH & LAB*

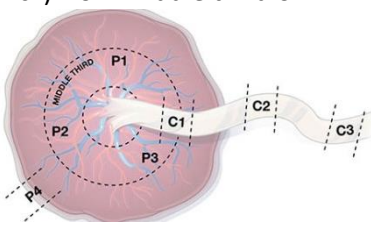
We recommend all testing at delivery be sent to the Illinois Dept of Public Health (IDPH) laboratory. Commercial testing is available for PCR (serum and urine) and serology (IgM); however, for surveillance purposes, we encourage all specimens be sent to IDPH lab. At most hospitals, the micro lab or the "referred testing lab" manage public health send-out specimens.

Communicate among obstetrics, pediatrics, pathology and hospital laboratory in advance to coordinate specimen collection and submission to IDPH lab. ***Specimens may be collected prior to obtaining approval and authorization codes. But, specimens should NOT be sent to the public health laboratory without prior authorization*** (See step 4 for how to obtain approval/authorization).

a. Infant Specimen Guidelines: pediatric service can order

Serum- *PCR and IgM*	Collect in serum separator tube (gold or marbled 'tiger tops') to obtain total volume of 1.0 ml of serum (i.e., amount of whole blood required is approximately 2.5-3 ml). Centrifuge and transfer serum to a separate tube
Urine-*PCR*	Collect at least 1 cc of urine in a sterile leak-proof container and wrap in parafilm. A patient-matched serum specimen must accompany a urine specimen submission.
Whole blood-*PCR*	Minimum volume required is 1.0 ml. Collect samples in EDTA (purple top) tube. A patient-matched serum specimen must accompany a whole blood submission.
CSF-*PCR and IgM*	Only if obtained for other studies, aliquot a sample (minimum 1.0 ml) for Zika testing. Collect in sterile container (15 or 50 ml conical tube). Close tightly and seal with parafilm.

b. Placenta/Tissue Guidelines: While testing is not always required (CDC will make ultimate decision), please collect and send to pathology and health department will arrange with pathology service

Placenta and membranes-*PCR, Histopathology (HP), immuno-histochemical staining (IHC)*	• At least 4 full-thickness pieces (0.5-1 cm x3-4 cm thick) from middle third of placenta and one from placental margin, including maternal and fetal sides of placenta, along with membranes taken from the area of rupture and including a small bit on the edge of the disk (5 x 12 cm strip), and any pathologic lesion, if present.  • May be refrigerated at +4°C for <24 hours until fixed in 10% buffered formalin for 3 days (72 hours). <u>After fixation</u>, if not paraffin-embedded, <u>tissues SHOULD be transferred to 70% ethanol</u> for long term storage and for shipping. • Place the sections in a two twist screw top sterile cup containing formalin. Tightly screw the lid to prevent leakage • Paraffin blocks may be submitted as well • Remainder of placenta can undergo routine, in hospital, pathologic evaluation
Umbilical cord-*PCR, HP, IHC*	≥ 3 segments (2.5 cm each) from proximal, middle, and distal to insertion site
Additional tissues (fetal demise) *PCR, HP, IHC*	<u>Note</u>: *It is critical to maintain the tissue architecture to evaluate viral pathology. Certain fetal tissues require longer fixation, please fix brain specimens for 48-72 hours.* • Brain/spinal cord: 0.5–1 cm^3 each (≥ 5 specimens from different parts of each) • Solid organ (heart, lung, liver, kidneys, skeletal muscle, eyes, bone marrow):

	0.5-1.0 cm^3 each (1 representative specimen from each solid organ); eye highly recommended • Fixed in formalin or paraffin • Remainder of tissue can undergo routine, in-hospital, pathologic evaluation

*****NOTE: <u>For authorization of tissue specimens only, the health department will need the following:</u>**

- Maternal ultrasound results (if applicable, please include dates and findings)
- Birth Measurements and Percentiles (e.g., Head Circumference, Birth Weight, Birth Length)
- Newborn exam findings and any additional testing/imaging (including TORCH or genetic testing)

c. Maternal Specimen Guidelines: obstetric service may order

Serum-*IgM, PCR*	Collect samples in serum separator tube (gold or marbled 'tiger tops') to obtain total volume of 1.0 ml of serum (i.e., amount of whole blood required is approximately 2.5-3 ml). Centrifuge and transfer serum to a separate tube
Whole blood-*PCR*	Minimum volume required is 1.0 ml. Collect samples in EDTA (purple top) tube. A patient-matched serum specimen must accompany a whole blood specimen submission.
Urine-*PCR*	Collect 3 cc of urine in a sterile leak-proof container and wrap in parafilm. A patient-matched serum specimen must accompany a urine specimen submission.

d. How to label and store specimens

- Label specimens with **name, date of birth, date and time of specimen collection, and description of specimen type**, e.g. "formalin-fixed placenta," "infant serum," or "infant urine". For tissue samples, label these specimens with the mother's name/mother's date of birth. For specimens collected directly from the infant, label these specimens with the infant's name/infant's date of birth.
- For serum, urine, and CSF specimens, freeze to -70°C after collection. If no -70°C freezer is available, refrigerate at +4°C and transport on cold packs within 72 hours of collection.
- Store human whole blood (EDTA) specimens at 2-8°C. Do not freeze. Transport on cold packs.
- Notes on formalin fixing: Fixed tissues should be stored and shipped at room temperature.
  - The volume of formalin used to fix tissues should be 10x the volume of tissue.
  - Place tissue in 10% buffered formalin for a minimum of three days or until fully fixed. After fixation, tissue can be transferred to 70% ethanol for long term storage.
  - DO NOT FREEZE samples that have been fixed in formalin.

e. Standard precautions should be used in specimen collection, handling and storage.

f. How to obtain approval/authorization code: See step 4 below

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<u>STEP 3</u>: Complete infant assessment and CDC U.S. Zika Registry Form
(<u>when mother is known to be Zika-positive</u>, *other cases will be determined after lab results complete*)

a. **Use CDC guidelines for infant evaluation:** https://www.cdc.gov/zika/pdfs/pediatric-evaluation-follow-up-tool.pdf

b. Enter data into CDC Registry "integrated neonate assessment form: "www.chicagohan.org/zforms

c. Go to step 4 for submitting registry form to health dept as soon as possible after birth/diagnosis

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STEP 4: Report case to Health Department and get testing authorization/approval

- **When patient is a CHICAGO RESIDENT:** Contact Chicago Department of Public Health. CDPH Zika hotline: 312-746-4835 or email: zika@cityofchicago.org
  - Specimen approval/authorization code: find authorization form at www.chicagohan.org/zforms
  - Submission of authorization form: fax 312-746-4683; You will be contacted with an authorization code within 24 hours (on Monday if on weekend).
  - CDC US Zika Registry Neonate assessment form (Scenario A only): ***If pediatrician known at time of delivery, please indicate name and contact information for provider on fax cover sheet.*** Fax 312-746-4683
- **When patient is a COOK COUNTY (outside of Chicago) RESIDENT:** Contact Cook County Department of Public Health. Mabel Frias; 708-836-8699; mfrias@cookcountyhhs.org ;
- **To report birth defects**, regardless of Zika exposure, please see Appendix C

QUESTIONS*:*

- **CHICAGO RESIDENTS*:*** 8am-4pm M-F: call CDPH Zika hotline: 312-746-4835 or email: zika@cityofchicago.org; After hours: call 311 and ask for on call communicable disease physician
- **COOK CTY (outside of Chicago) RESIDENTS:** contact Mabel Frias: 708-836-8699; mfrias@cookcountyhhs.org

https://www.cdc.gov/zika/pdfs/pediatric-evaluation-follow-up-tool.pdf (updated Aug 19, 2016)
http://www.cdc.gov/zika/pdfs/collection-submission-specimens-zika-testing-at-birth.pdf (updated August 19, 2016)
http://www.cdc.gov/zika/pdfs/collection-submission-fetal-tissues-zika-testing.pdf

Appendix A: Screening for Zika Exposure

HEALTHY CHICAGO
CHICAGO DEPARTMENT OF PUBLIC HEALTH

Zika Screening Tool for Pregnant Women at Labor and Delivery

Questions to assess for possible exposure to Zika virus	Response
1. Do you live in or do you frequently travel (daily or weekly) to an area with active Zika virus transmission?: https://www.cdc.gov/zika/geo/index.html	Yes / No
2. Have you traveled to an area with Zika during pregnancy or just before you became pregnant (8 weeks before conception or 6 weeks before your last menstrual period)?	Yes / No
3. Have you had sex (vaginal, anal, or oral sex) without a condom or shared sex toys with a partner(s) who lives in or has traveled to a Zika affected area (Within six months preconception and/or during pregnancy)?	Yes / No

"Yes" to ANY **and symptomatic** (fever, rash, arthralgia, conjunctivitis) OR **"Yes"** to question 1 **and asymptomatic= Testing recommended**

"No" to ALL =No Exposure

Assess for prior testing

Negative By PCR and IgM when tested <12 weeks post symptom onset

NOTHING ADDITIONAL TO BE DONE AT LABOR AND DELIVERY

Non-negative PCR or IgM results/pending/unsure of results= Contact CDPH for support

To request **no cost** Zika testing through the Illinois Department of Health (IDPH), complete the **testing authorization request form** at

https://www.chicagohan.org/zforms

An **authorization code** will be provided by email to the provider contact listed on the request.

For additional information, contact the Chicago Department of Public Health (CDPH)
Zika response line: 312-746-4835 or email: zika@cityofchicago.org
For urgent matters, you may reach the Communicable Disease Physician on-call by calling 311 (or 312-744-5000 if outside the City of Chicago)

Appendix B: Summary Table on Testing and Specimen collection at birth ***when mother has Zika exposure history***

Maternal test status or birth anomaly	**Test infant at birth?***	**Test mother at birth?***	**Collect placenta and umbilical cord?****	**Head ultrasound of infant prior to discharge**
Mother not tested	No, unless infant anomaly	Yes, but only if symptomatic for Zika during pregnancy, or ongoing/frequent exposure	No, unless infant anomaly	No, unless infant anomaly
Mother tested, results pending/ unknown	No, unless infant anomaly	No	No, unless infant anomaly	No, unless infant anomaly
Mother tested > 12 weeks after exposure	No, unless infant anomaly	No	No, unless infant anomaly	No, unless infant anomaly
Mother with confirmed Zika	Yes	No	No	Yes
Mother with unspecified flavivirus infection	Yes	No	Yes	Yes
Birth defect or anomaly present	Yes	Yes	Yes, unless mother already known to have confirmed Zika	Yes

* Serum, urine and whole blood should be collected
** Pathology specimens tested in public health laboratory after CDC approval

Appendix C: Notify IDPH of Birth Defects

Birth Defect Surveillance Notification Protocol

Any baby born with one of the birth defects below needs two steps completed:

1. **Assess for Zika Exposure (and test infant, if necessary)**

2. **Notify Illinois Department of Public Health (IDPH) of birth defect <u>regardless of Zika exposure</u>**
   - **Use APORS* (Adverse Pregnancy Outcomes Reporting System)**
   - Notification should take place as soon as diagnosis is known
   - Begin new submission in APORS database
     - <u>Electronic</u>:
       - In the "other concerns" section of the form please include the following:
         - Provider name
         - Clinic name
         - Phone number
       - Once the available information is entered choose "save without edits"
       - Once the baby is discharged from the hospital, finish completing the APORS referral by hitting "save," as per usual routine
     - <u>Paper based</u>:
       - A copy of the form marked "preliminary" can be faxed to APORS.
       - Please add provider name, clinic name and phone number
       - After the baby is discharged, the remainder of the form should be completed in usual way, and then sent to APORS. The marking "preliminary" should be crossed out before sending the second time.
       - Fax forms to: 217-557-5152 or 217-558-4122; Attn: IDPH APORS

QUESTIONS???

- Contact IDPH: Theresa Sandidge, <u>dph.apors@illinois.gov</u>, 217-524-3674
- Contact CDPH: 8am-4pm M-F: call CDPH Zika hotline: 312-746-4835 or email: zika@cityofchicago.org; After hours: call 311 and ask for on call communicable disease physician

CONDITIONS THAT MEET APORS CRITERIA FOR REPORTING:

Congenital brain anomalies

- Microcephaly
- Abnormal brain structures
- Atrophy of brain structures
- Abnormal cortical formation
- Congenital hydrocephaly/ventriculomegaly
- Holoprosencephaly
- In utero IVH
- Intracranial calcifications

Congenital contractures

- Arthrogryposis

Neural tube defects

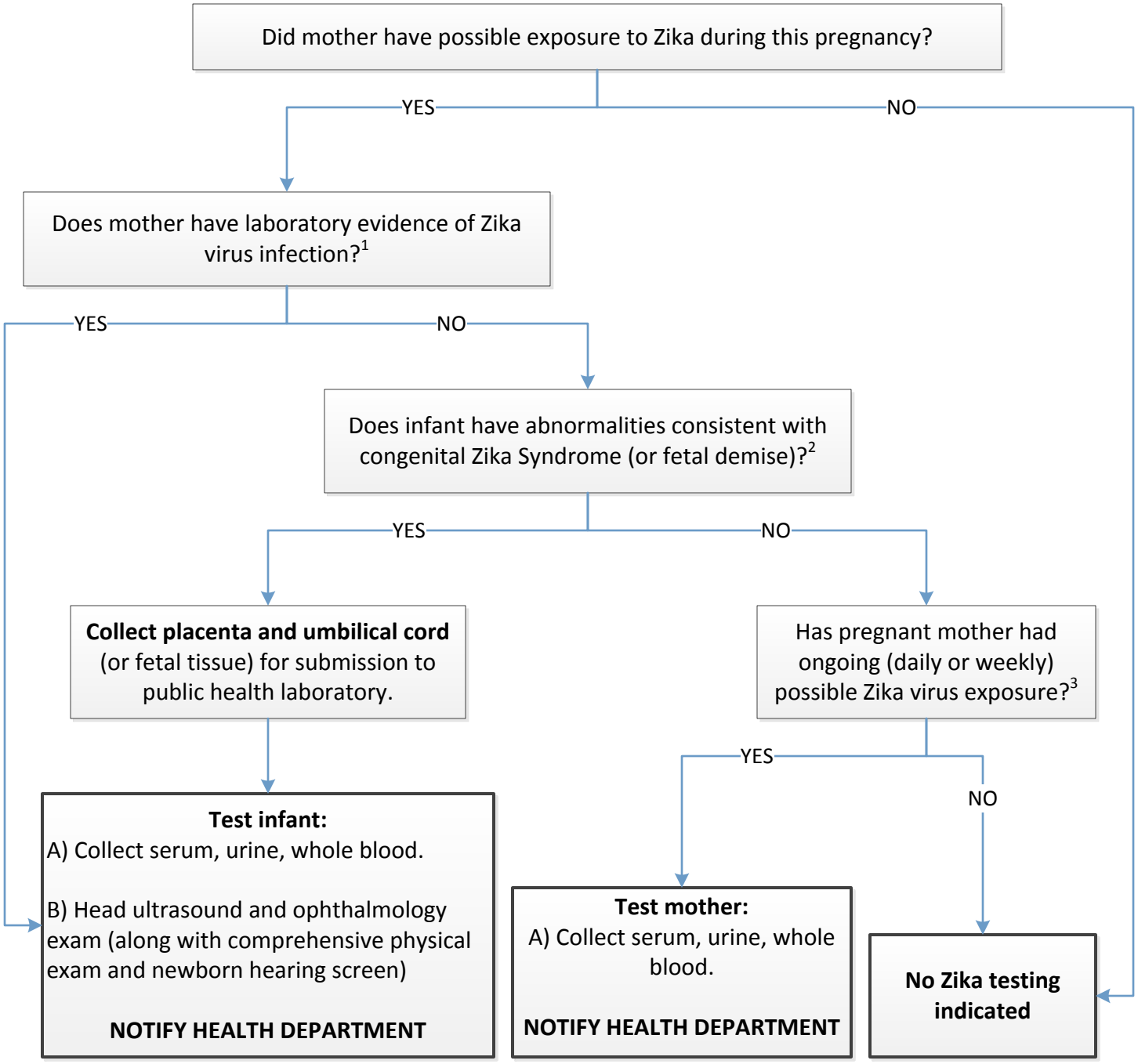
- Anencephaly
- Encephalocele
- Spina bifida

Significant eye anomalies (excluding retinopathy of prematurity)

- Anophthalmia/microphthalmia
- Coloboma
- Cataracts
- Calcifications
- Chorioretinal anomalies (e.g. atrophy, scarring, macular pallor, pigmentary mottling, retinal hemorrhage.)
- Optic nerve abnormalities (including atrophy and pallor)

***APORS:** *Adverse Pregnancy Outcomes Reporting System (APORS) is a State surveillance effort that collects information on Illinois infants born with birth defects or other abnormal conditions. Each hospital reports cases to the State within 7 days of discharge.*

ZIKA VIRUS DELIVERY CHECKLIST



[1] Prenatal maternal serum or urine RT-PCR positive for Zika OR Prenatal maternal serology reflects either:

- IgM positive where PRNT pending OR
- PRNT result indicates Zika Virus or undifferentiated flavivirus

[2] Congenital brain abnormalities (including microcephaly), congenital contractures, neural tube defects, significant eye anomalies

[3] Persons with ongoing possible exposure include those who reside in or frequently travel (e.g., daily or weekly) to an area with risk for Zika virus transmission.