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## **ACUTE UPPER RESPIRATORY INFECTION (COMMON COLD)**

### **SUBJECTIVE**

Sneezing, "stuffiness" of head  
Malaise, fatigue Sore throat, cough Poor appetite  
Low grade or no fever history

### **OBJECTIVE**

Congested nasal passages  
Serous nasal discharge, moist and boggy nasal mucous membranes  
Lung fields clear  
Low grade fever may be present

### **ASSESSMENT**

Upper respiratory infection (common cold)

### **PLAN**

Acetaminophen for pain or fever  
May humidify the air (vaporizer or bathroom shower water) to relieve nasal and pharyngeal discomfort and cough; vaporizer should not be used if allergic to molds  
Nasal congestion may be relieved as follows by normal saline nose drops. (1/4-1/2 teaspoon salt to 1 cup water) every 4 hours PRN; for infants to 2 years, recommend suction gently with infant syringe  
OTC decongestant as appropriate and if not contraindicated (follow label directions)

### **Health Teaching:**

Instruct patient to rest and force fluids  
Teach proper hand washing technique, cover mouth while coughing, and tissue disposal to prevent spread of disease

### **Referral Indicators:**

Purulent nasal discharge  
Pharyngeal exudate and/or tender cervical nodes  
Red and/or bulging tympanic membranes  
Tender sinuses  
Fever extending beyond 48 hours/antipyretic does not bring fever below 101° F Infants 0-12 months with fever 100.5° F rectally  
Infants < 2 months with significant symptoms, with or without fever  
Children under 2 years if no improvement in 24 hours, or signs and symptoms worsen

### **Follow-Up:**

Patient/parent will be asked to contact health provider if condition persist or worsen

### **Reference:**

Mayo Clinic, Guide To Self-Care, Fifth Edition 2006

## ASSESSMENT OF IRON INTAKE AND MANAGEMENT OF IRON DEFICIENCY ANEMIA

### Background

#### Childhood Anemia

Childhood anemia is a very common diagnosis and usually occurs due to an inadequate amount of dietary iron. Adequate iron storage is necessary to prevent anemia, but is also essential for brain development. In order to prevent iron-deficiency anemia, infants should be drinking either breast milk or iron-fortified formula. Toddlers and older children should eat a balanced, iron-rich diet.

Although iron deficiency is the most common etiology, anemia in childhood can be caused by a variety of conditions that are either congenital or acquired. Types of congenital anemia include sickle cell disease or thalassemia; acquired anemia includes such diagnoses as leukemia, gastrointestinal bleeding, and hemolytic disease. Congenital and acquired anemia generally is not iron-responsive. If a child presents with a pre-diagnosed anemia that is NOT iron-deficient, he/she should be referred to his/her provider for further management.

Sickle cell anemia can be easily ruled out by checking the status of the newborn screening. If sickle cell anemia is strongly suspected and an asymptomatic infant's disease status is unknown, refer to his/her provider, and delay replacement iron regimen until the results are available.

#### Adult Anemia

Anemia in adults is most commonly due to iron deficiency. In contrast to iron deficiency in childhood, which is most commonly caused by deficient dietary intake, the major cause of iron deficiency anemia is blood loss, which can be overt (trauma, hematemesis, melena, menorrhagia, etc.) or occult (e.g. via the gastrointestinal tract). Iron deficiency can also result from dietary deficiencies or reduced gastrointestinal absorption; however, blood loss should first be ruled out by the patient's primary care physician as a cause of iron deficiency before nutritional deficiency or malabsorption is assumed as a diagnosis.

#### Anemia Screening Procedure

Anemia screening is performed by checking hemoglobin levels. **Confirm abnormal/low hemoglobin levels with a second test at the same or a new site.** Make sure the skin is clean and dry before puncture. Avoid any squeezing of the digit after puncture. After the diagnosis of anemia, iron deficiency anemia is confirmed by administering a therapeutic regimen of iron and demonstrating a rise in hemoglobin of  $\geq 1$  g/dL after 4 weeks. If an infant fails to respond to therapy, referral shall be made to the patient's PCP or to a health department physician or APN for further evaluation.

**SUBJECTIVE**

Dietary assessment

- Inadequate consumption of dietary iron
- Consumption of whole cow's milk or formula with low iron or no iron
- Children > age 1 year: consumption of more than 24 ounces of milk daily

Menstrual history (if appropriate)

Patient reported history of gastrointestinal blood loss

Normal versus abnormal newborn state screen for sickle cell disease

Symptoms: Pallor, shortness of breath, tachycardia, decreased energy/fatigue/lethargy, dizziness

**OBJECTIVE**

Fatigued appearance

Pallor of skin and/or conjunctiva

Dyspnea

Tachycardia

Heart murmur

Abnormal/low hemoglobin (hgb), see chart below

Age	Criteria for anemia (hemoglobin concentration in g/dL)	
	Female	Male
6-12 months	<11.0	<11.0
1-2 years	<11.0	<11.0
2-5 years	<11.1	<11.1
5-8 years	<11.5	<11.5
8-12 years	<11.9	<11.9
<b>12-15 years (non-pregnant)</b>		
Nonsmoker	<11.8	<12.5
Smoke up to 1 pack/day	<12.1	<12.8
Smoke 1-2 packs/day	<12.3	<13.0
Smoke >2 packs/day	<12.5	<13.2
<b>15-18 years (non-pregnant)</b>		
Nonsmoker	<12.0	<13.3
Smoke up to 1 pack/day	<12.3	<13.6
Smoke 1-2 packs/day	<12.5	<13.8
Smoke >2 packs/day	<12.7	<14.0
<b>&gt;18 years (non-pregnant)</b>		
Nonsmoker	<12.0	<13.5
Smoke up to 1 pack/day	<12.3	<13.8
Smoke 1-2 packs/day	<12.5	<14.0
Smoke >2 packs/day	<12.7	<14.2

Age	Criteria for anemia (hemoglobin concentration in g/dL)	
	Female	Male
<b>PREGNANT: 1<sup>st</sup> Trimester</b>		
Nonsmoker	<11.0	N/A
Smoke up to 1 pack/day	<11.3	N/A
Smoke 1-2 packs/day	<11.5	N/A
Smoke >2 packs/day	<11.7	N/A
<b>PREGNANT: 2<sup>nd</sup> Trimester</b>		
Nonsmoker	<10.5	N/A
Smoke up to 1 pack/day	<10.8	N/A
Smoke 1-2 packs/day	<11.0	N/A
Smoke >2 packs/day	<11.2	N/A
<b>PREGNANT: 3<sup>rd</sup> Trimester</b>		
Nonsmoker	<11.0	N/A
Smoke up to 1 pack/day	<11.3	N/A
Smoke 1-2 packs/day	<11.5	N/A
Smoke >2 packs/day	<11.7	N/A

**ASSESSMENT**

Not at risk for iron depletion with normal hemoglobin

**OR**

At risk for iron depletion with normal hemoglobin

- Infant at risk: preterm, low birth weight, diet of non-iron fortified infant formula, introduction of cow's milk prior to 12 months of age, or breastfed infant who is receiving inadequate dietary iron after six months of age
- Toddler/child/adolescent at risk: consumption of more than 24 ounces of cow's milk daily, low dietary iron intake/picky eaters, previous history of iron deficiency

**OR**

Anemia, suspect iron-deficiency

**PLAN**

For those not at risk for iron depletion with a normal hemoglobin

Instruct in age appropriate diet high in iron

Certification for WIC if eligible

Educate regarding the importance of iron for both blood and brain development

For those at risk of iron depletion with a normal hemoglobin

Instruct in age appropriate diet high in iron

Issue age-appropriate multivitamin with iron or write prescription:

- Infant/toddler multivitamin with iron drops at dose of 1 ml daily **OR**
- Children's chewable multivitamin with iron at dose of one tablet daily per manufacturer's directions
- **NOTE:** If multivitamins with iron are used in an infant who is not anemic, the daily dose should not exceed 15 mg elemental iron daily or 2 mg/kg/day. Most infant/toddler *multivitamin* with iron drops contain 10 mg elemental iron per milliliter. Most chewable multivitamins with iron for toddlers and older children/adolescents contain 15-18 mg elemental iron per tablet. These should be administered according to package instructions.

Give iron-related pamphlet

Certification for WIC if eligible

Educate regarding the importance of iron for both blood and brain development

For those with suspected iron deficiency anemia, see table below and refer to the Iron replacement Dosing Chart:

Age <6 months	Age 6-12 Months	Age 1-3 Years	Age 3-12 Years	Age 12-18 Years	>18 Years
Obtain dietary assessment	Obtain dietary assessment	Obtain dietary assessment	Obtain dietary assessment	Obtain dietary assessment	Evaluate for blood loss (history, physical, hemocult)
Instruct to use breast milk or iron fortified formula	Instruct in adequate consumption of dietary iron	Instruct in adequate consumption of dietary iron	Instruct in adequate consumption of dietary iron	Instruct in adequate consumption of dietary iron	Consider referral to MD or NP
Supplement with iron according to the dose based on body weight (see dosing chart)	Give iron-related pamphlet  Refer to WIC if eligible	Decrease milk if necessary to 16 ounces or less daily  Give iron-related pamphlet	Decrease milk if necessary to 16 ounces or less daily  Give iron-related pamphlet	Decrease milk if necessary to 16 ounces or less daily  Give iron-related pamphlet	Instruct in adequate consumption of dietary iron and Vitamin C
Refer to WIC if eligible	Supplement with iron according to dose based on body weight (see dosing chart)	Refer to WIC if eligible  Supplement with iron according to dose based on body weight (see dosing chart)	Refer to WIC if eligible (< 5 yrs.)  Supplement with iron according to dose based on body weight (see dosing chart)	Supplement with iron according to dose based on body weight (see dosing chart)	Issue Ferrous Sulfate (FeSO <sub>4</sub> ) 325mg pills. Take one by mouth three times per day.

### Health Teaching

Oral iron may cause constipation and turn stool black

Establish regular time for drug administration

Iron drops may harmlessly coat the teeth

Oral iron may interfere with absorption of tetracycline  
 Vitamin C will enhance absorption  
 Iron absorption is inhibited by antacids, Vitamin E, eggs, coffee, tea, and milk  
**ORAL IRON IS A SERIOUS POTENTIAL POISON - Issue safely**

### Referral Indicators

Premature infant  
 Poor weight gain/abnormal growth pattern  
 Symptomatic anemia (see “objective” for list of possible symptoms)  
 Heart murmur present  
 Pregnancy  
 Pre-diagnosed anemia that is NOT iron-deficient  
 Sickle cell disease and other hemoglobinopathies  
 Symptoms of gastrointestinal bleeding (dark tarry stools, blood in toilet bowl or on toilet paper, large amounts of blood passed from the rectum, vomiting blood)  
 Special health needs that increase the risk of iron-deficiency (chronic infection, inflammatory disorders, chronic or acute blood loss, restricted diets, use of medications that interfere with iron absorption)  
 Parent needs further guidance/education (subjective evaluation by RN/RD)  
 Inadequate response to therapy

### CRITICAL VALUES:

**For ages <5:** Refer immediately for hemoglobin of **8.5 or less** or if the patient is symptomatic

**For ages 5 and up:** Refer immediately for hemoglobin of **10 or less** or if the patient is symptomatic

\*For all ages, if the patient is symptomatic, they should be referred to their primary care provider immediately

### Follow-up

For individuals with normal hemoglobin or iron depletion with normal hemoglobin:

Screen for anemia at routine intervals during WIC visits and/or preventive care visits (EPSDT exams)

For individuals with suspected iron deficiency anemia:

Evaluate for compliance to dietary and iron therapy

Repeat hemoglobin in 4 weeks, confirm at least 1 g/dL increase in hemoglobin

- **If there less than a 1 g/dL increase in hemoglobin after 4 weeks of iron supplementation, confirm that the dose is appropriate, there is no dairy overconsumption, and that the patient is compliant. If there are no confounding factors and the hemoglobin has not gone up, refer to health care provider.**

- **If there is at least 1g/dL increase in hemoglobin, continue iron supplementation for 8 weeks after hemoglobin confirmed normal.**

Refer to health care provider if compliant infant shows inadequate response to therapy or hemoglobin remains below normal range despite 6-8 weeks of iron supplementation.

### **Iron Replacement Dosing Chart**

All treatment of iron deficiency anemia is two-fold, a diet high in iron rich foods and therapeutic regimens of iron.

If concentrated iron drops, elixir or tablets are used in an infant or child that is anemic, the dose should not exceed 6 mg/kg of elemental iron daily to a maximum of the standard adult dose. Replacement iron doses may be divided into two or three daily doses. Liquid concentrated iron preparations are generally accepted but may not be palatable. If a child refuses to take the prescribed preparation, another may be used as long as the daily dose of elemental iron remains consistent.

**All doses referenced in this protocol and on the dosing chart refer to either:**

- **Concentrated ferrous sulfate drops that contain 15 mg/1.0 ml elemental iron.**  
**OR**
- **Ferrous sulfate elixir that contain 44 mg/5.0 mL elemental iron.**  
**OR**
- **325 mg ferrous sulfate tablets that contain 65 mg elemental iron per tablet.**

**Instruct the caregiver regarding measurement using calibrated, oral medication syringes. Doses in milliliters require a precise dropper or oral syringe with well-marked increments of 0.1 ml.**

Maximizing the dose for body weight is very important.

### Iron Replacement Dosing Chart

Weight		Dosing Script (Write This on Prescription)		
Lbs	Kgs	IRON DROPS (15 mg / 1.0 ml)	ELIXIR (44 mg / 5.0 ml)	TABLETS (65 mg / tablet)
10	4.5	10.2 mg elemental iron (0.7 ml) po bid		
11	5.0	11.3 mg elemental iron (0.8 ml) po bid		
12	5.5	12.3 mg elemental iron (0.8 ml) po bid		
13	5.9	13.3 mg elemental iron (0.9 ml) po bid		
14	6.4	14.3 mg elemental iron (1.0 ml) po bid		
15	6.8	15.3 mg elemental iron (1.0 ml) po bid		
16	7.3	16.4 mg elemental iron (1.1 ml) po bid		
17	7.7	17.4 mg elemental iron (1.2 ml) po bid		
18	8.2	18.4 mg elemental iron (1.2 ml) po bid		
19	8.6	19.4 mg elemental iron (1.3 ml) po bid		
20	9.1	20.5 mg elemental iron (1.4 ml) po bid		
21	9.5	21.5 mg elemental iron (1.4 ml) po bid		
22	10.0	22.5 mg elemental iron (1.5 ml) po bid		
23	10.5	23.5 mg elemental iron (1.6 ml) po bid		
24	10.9	24.5 mg elemental iron (1.6 ml) po bid		
25	11.4	25.6 mg elemental iron (1.7 ml) po bid		
26	11.8	26.6 mg elemental iron (1.8 ml) po bid		
27	12.3	27.6 mg elemental iron (1.8 ml) po bid		
28	12.7	28.6 mg elemental iron (1.9 ml) po bid		
29	13.2	29.7 mg elemental iron (2.0 ml) po bid		
30	13.6	30.7 mg elemental iron (2.0 ml) po bid		
31	14.1	31.7 mg elemental iron (2.1 ml) po bid		
32	14.5	32.7 mg elemental iron (2.2 ml) po bid		
33	15.0	33.8 mg elemental iron (2.3 ml) po bid	33.8 mg elemental iron (3.8 ml) po bid	
34	15.5	34.8 mg elemental iron (2.3 ml) po bid	34.8 mg elemental iron (4.0 ml) po bid	
35	15.9	35.8 mg elemental iron (2.4 ml) po bid	35.8 mg elemental iron (4.1 ml) po bid	
36	16.4	36.8 mg elemental iron (2.5 ml) po bid	36.8 mg elemental iron (4.2 ml) po bid	
37	16.8	37.8 mg elemental iron (2.5 ml) po bid	37.8 mg elemental iron (4.3 ml) po bid	
38	17.3	38.9 mg elemental iron (2.6 ml) po bid	38.9 mg elemental iron (4.4 ml) po bid	
39	17.7	39.9 mg elemental iron (2.7 ml) po bid	39.9 mg elemental iron (4.5 ml) po bid	
40	18.2	40.9 mg elemental iron (2.7 ml) po bid	40.9 mg elemental iron (4.6 ml) po bid	
41	18.6	41.9 mg elemental iron (2.8 ml) po bid	41.9 mg elemental iron (4.8 ml) po bid	
42	19.1	43.0 mg elemental iron (2.9 ml) po bid	43.0 mg elemental iron (4.9 ml) po bid	
43	19.5	44.0 mg elemental iron (2.9 ml) po bid	44.0 mg elemental iron (5.0 ml) po bid	
44	20.0		45.0 mg elemental iron (5.1 ml) po bid	

Weight		Dosing Script (Write This on Prescription)		
Lbs	Kgs	IRON DROPS (15 mg / 1.0 ml)	ELIXIR (44 mg / 5.0 ml)	TABLETS (65 mg / tablet)
45	20.5		46.0 mg elemental iron (5.2 ml) po bid	
46	20.9		47.0 mg elemental iron (5.3 ml) po bid	
47	21.4		48.1 mg elemental iron (5.5 ml) po bid	
48	21.8		49.1 mg elemental iron (5.6 ml) po bid	
49	22.3		50.1 mg elemental iron (5.7 ml) po bid	
50	22.7		51.1 mg elemental iron (5.8 ml) po bid	
51	23.2		52.2 mg elemental iron (5.9 ml) po bid	
52	23.6		53.2 mg elemental iron (6.0 ml) po bid	
53	24.1		54.2 mg elemental iron (6.2 ml) po bid	
54	24.5		55.2 mg elemental iron (6.3 ml) po bid	
55	25.0		56.3 mg elemental iron (6.4 ml) po bid	
56	25.5		57.3 mg elemental iron (6.5 ml) po bid	
57	25.9		58.3 mg elemental iron (6.6 ml) po bid	
58	26.4		59.3 mg elemental iron (6.7 ml) po bid	
59	26.8		60.3 mg elemental iron (6.9 ml) po bid	
60	27.3		61.4 mg elemental iron (7.0 ml) po bid	
61	27.7		62.4 mg elemental iron (7.1 ml) po bid	
62	28.2		63.4 mg elemental iron (7.2 ml) po bid	
63	28.6		64.4 mg elemental iron (7.3 ml) po bid	
64	29.1		65.5 mg elemental iron (7.4 ml) po bid	One tablet (65.0 mg elemental iron) po bid
65	29.5		66.5 mg elemental iron (7.6 ml) po bid	One tablet (65.0 mg elemental iron) po bid
66	30.0		67.5 mg elemental iron (7.7 ml) po bid	One tablet (65.0 mg elemental iron) po bid
67	30.5		68.5 mg elemental iron (7.8 ml) po bid	One tablet (65.0 mg elemental iron) po bid
68	30.9		69.5 mg elemental iron (7.9 ml) po bid	One tablet (65.0 mg elemental iron) po bid
69	31.4		70.6 mg elemental Iron (8.0 ml) po bid	One tablet (65.0 mg elemental iron) po bid
70	31.8		71.6 mg elemental iron (8.1 ml) po bid	One tablet (65.0 mg elemental iron) po bid
71	32.3		72.6 mg elemental iron (8.3 ml) po bid	One tablet (65.0 mg elemental iron) po bid
72	32.7		73.6 mg elemental iron (8.4 ml) po bid	One tablet (65.0 mg elemental iron) po bid
73	33.2		74.7 mg elemental iron (8.5 ml) po bid	One tablet (65.0 mg elemental iron) po bid
73 - 95	33.2 43.2		86.0 mg elemental iron (9.8 ml) po bid	One tablet (65.0 mg elemental iron) po bid
> 95	> 43.2		64.8 mg elemental iron (7.4 ml) po tid	One tablet (65.0 mg elemental iron) po tid

### **Writing a Prescription for Iron Replacement** **Provider and Pharmacist Prescription Guidance**

When writing a prescription for ferrous sulfate, the dosage should be based strictly on the exact weight of the child. Use the following format when writing prescriptions for iron replacement. This format will help to standardize the instructions given to pharmacists and should help minimize dosing errors if the pharmacy needs to provide the medication in another formulation.

<b><i>For liquid iron preparations, write:</i></b>	<b><i>Example:</i></b>
Ferrous sulfate drops (15mg elemental iron/1.0 mL) Sig (insert dosing script from dosing chart) #QS 1 month, 3 refills	Ferrous sulfate drops (15 mg elemental iron/1.0 mL) Sig 10.2 mg elemental iron (0.7 mL) po bid #QS 1 month, 2 refills
Or	Or
Ferrous sulfate elixir (44mg elemental iron/5.0 mL) Sig (insert dosing script from dosing chart) #QS 1 month, 3 refills	Ferrous sulfate elixir (44 mg elemental iron/5.0 mL) Sig 66 mg elemental iron (7.5 mL) po bid #QS 1 month, 3 refills
<b><i>For iron tablets, write:</i></b>	<b><i>Example:</i></b>
Iron tablets (65 mg elemental iron/tablet) Sig (insert dosing script based from dosing chart) #QS 1 month, 3 refills	Iron tablets (65 mg elemental iron/tablet) Sig one tablet (65 mg elemental iron) po tid #QS 1 month, 3 refills

### **REFERENCES**

- Tennessee WIC Manual, Nutrition Risk Criteria section, revised 2012.
- Centers for Disease Control and Prevention. Recommendations to Prevent and Control Iron Deficiency in the United States. MMWR. April 03, 1998/47(RR-3); 1-36. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/00051880.htm>.
- Tennessee Laboratory Policy & Procedure Manual for Local Health Departments, revised 2000.
- Baker RD, Greer MD, AAP Committee on Nutrition. Clinical Report—Diagnosis and Prevention of Iron Deficiency and Iron-Deficiency Anemia in Infants and Young Children (0-3 Years of Age). Pediatrics. 2010; 126(5): 1-22.
- Segel GB, Hirsh MG, Feig SA. Managing anemia in pediatric office practice. Pediatrics in Review. 2002; 23(3): 75-84.
- Mahoney DH, et al. Iron deficiency in infants and young children: Treatment. In: UpToDate, Hoppin, AG (Ed), UpToDate, Waltham, MA, 2010.
- Schrier SL, Mentzer WC. Causes and diagnosis of anemia due to iron deficiency, In: UpToDate, SA (Ed), UpToDate, Waltham, MA, 2011.

## **BLOOD PRESSURE, ELEVATED CHILDREN 1-17 YEARS OF AGE**

### **GENERAL INFORMATION**

Based on the Fourth Report of the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of Hypertension in Children and Adolescents, the following definitions are provided:

**Normal BP** in children is defined as an average systolic and diastolic BP  $\leq$ 90th percentile for gender, age and height

**Hypertension** in children is defined as an average systolic BP and/or diastolic BP that is  $\geq$  95th percentile for gender, age, and height on  $\geq$  3 separate occasions

**Prehypertension** in children is defined as an average systolic BP or diastolic BP that are  $\geq$  90th percentile but  $<$ 95th percentile or a BP that exceeds 120/80 mmHg even if below the 90<sup>th</sup> percentile

In order to achieve an accurate blood pressure reading, it is recommended that:

The child be free of stimulant drugs or food AND

Have been sitting quietly for 5 minutes AND

Be seated with his or her back supported, feet on the floor, and right arm supported, cubital fossa at heart level

The right arm is preferred in repeated measures of BP for consistency and comparison with standard tables; it is also important because of the possibility of coarctation of the aorta, which might lead to false (low) readings in the left arm

### **PLAN**

Obtain the child's height and age

Use a cuff appropriate to the size of the child's upper arm – BP using auscultation is preferred

Have child sit quietly for 5 minutes with feet and back supported

Check BP of any child over 3 years of age using the right arm

If BP is  $\leq$ 90<sup>th</sup> percentile, the BP is normal

**If the BP is  $>$  5 mm Hg above the 99<sup>th</sup> percentile, REFER PROMPTLY**

**If the patient is symptomatic, REFER IMMEDIATELY**

If automatic BP cuff is used and the child is found to have elevated BP  $\geq$  90<sup>th</sup> percentile, repeat BP using auscultation after sitting quietly for 5 minutes

If BP found to be elevated ( $\geq$  95<sup>th</sup> percentile) based on systolic and diastolic reading, age, gender and height (using attached chart), repeat BP in one week

If BP continues to be elevated on the second visit, check BP again in one week

If the third BP check is still elevated and the average of the 3 BPs is  $\geq$  95<sup>th</sup> percentile,

**REFER**

**Using the BP Chart**

1. Obtain height and age of child
2. Measure and record BP
3. Find correct gender chart
4. Find the child's age on the left side of the chart, follow the age row horizontally across the table to the intersection of the line for the height percentile (vertical column)
5. Find the 50<sup>th</sup>, 90<sup>th</sup>, and 99<sup>th</sup> percentiles for systolic and diastolic BP in the right columns
 

BP < 90 <sup>th</sup> percentile	= Normal
BP between the 90 <sup>th</sup> and 95 <sup>th</sup>	= Prehypertensive
BP > 95 <sup>th</sup> percentile X 3 checks	= May Be Hypertensive
BP > 99 <sup>th</sup> percentile + 5 mm Hg	= Probably Hypertensive

**Health Teaching**

Counsel the child on prevention and health related life-styles such as:

Weight reduction

Increased physical activity

Dietary modification such as decreased sugar, salt, and an increase in fresh fruits and vegetables, regular meals, and a healthy breakfast

If Prehypertensive counsel regarding the need for BP recheck in 6 months

**Referral Indicators**

BP > 99<sup>th</sup> percentile + 5 mm Hg (PROMPTLY, if symptomatic IMMEDIATE)

Average of 3 BP > 95<sup>th</sup> percentile

Symptoms of elevated BP (i.e. headache, blurred vision, vertigo, chest pain, edema, nausea and vomiting, and alteration in consciousness)

**REFERENCE**

The Fourth Report on the Diagnosis, Evaluation, and treatment of High Blood Pressure in Children and Adolescents, U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute, May 2005

The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of high Blood Pressure, US Department of Health and Human Services, National Institutes of Health, National Heart, Lung and Blood Institute, National High Blood Pressure Education Program, December 2003

**Blood Pressure Levels for BOYS by Age and Height Percentile**

Age (Year)	BP Percentile ↓	Systolic BP (mmHg)							Diastolic BP (mmHg)						
		← Percentile of Height →							← Percentile of Height →						
		5th	10th	25th	50th	75th	90th	95th	5th	10th	25th	50th	75th	90th	95th
1	50th	80	81	83	85	87	88	89	34	35	36	37	38	39	39
	90th	94	95	97	99	100	102	103	49	50	51	52	53	53	51
	95th	98	99	101	103	104	106	106	54	54	55	56	57	58	58
	99th	105	106	108	110	112	113	114	61	62	63	64	65	66	66
2	50th	84	85	87	88	90	92	93	39	40	41	42	43	44	44
	90th	97	99	100	102	104	105	106	54	55	56	57	58	58	59
	95th	101	102	104	106	108	109	110	59	59	60	61	62	63	63
	99th	109	110	111	113	115	117	117	66	67	68	69	70	71	71
3	50th	86	87	89	91	93	94	95	44	44	45	46	47	48	48
	90th	100	101	103	105	107	108	109	59	59	60	61	62	63	63
	95th	104	405	407	109	110	112	113	63	63	64	65	66	67	67
	99th	111	112	114	116	118	119	120	71	71	72	73	74	75	75
4	50th	88	89	91	93	95	96	97	47	48	49	50	51	51	52
	90th	102	103	105	107	109	110	111	62	63	64	65	66	66	67
	95th	106	107	109	111	112	114	115	66	67	68	69	70	71	71
	99th	113	114	116	118	120	121	122	74	75	76	76	78	78	79
5	50th	90	91	93	95	96	98	98	50	51	52	53	54	55	55
	90th	104	105	106	108	110	111	112	65	66	67	68	69	69	70
	95th	108	109	110	112	114	115	116	69	70	71	72	73	74	74
	99th	115	116	118	120	121	123	123	77	78	79	80	81	81	82
6	50th	91	92	94	96	98	99	100	53	53	54	55	56	57	57
	90th	105	106	108	110	111	113	113	68	68	69	70	71	72	72
	95th	109	110	112	114	115	117	117	72	72	73	74	75	76	76
	99th	116	117	119	121	123	124	125	80	80	81	82	83	84	84
7	50th	92	94	95	97	99	100	101	55	55	56	57	58	59	59
	90th	106	107	109	111	113	114	115	70	70	71	72	73	74	74
	95th	110	111	113	115	117	118	119	74	74	75	76	77	78	78
	99th	117	118	120	122	124	125	126	82	82	83	84	85	86	86
8	50th	94	95	97	99	100	102	102	56	57	58	59	60	60	61
	90th	107	109	110	112	114	115	116	71	72	72	73	74	75	76
	95th	111	112	114	116	118	119	120	75	76	77	78	79	79	80
	99th	119	120	122	123	125	127	127	83	84	85	86	87	87	88
9	50th	95	96	98	100	102	103	104	57	58	59	60	61	61	62
	90th	106	110	112	114	115	117	118	72	73	74	75	76	76	77
	95th	113	114	116	118	119	121	121	76	77	78	79	80	81	81
	99th	120	121	123	125	127	128	129	84	85	86	87	88	88	89
10	50th	97	98	100	102	103	105	106	58	59	60	61	61	62	63
	90th	111	112	114	115	117	119	119	73	73	74	75	76	77	78
	95th	115	116	117	119	121	122	123	77	78	79	80	81	81	82
	99th	122	123	125	127	128	130	130	85	86	86	88	88	89	90

**Blood Pressure Levels for BOYS by Age and Height Percentile (Continued)**

Age (Year)	BP Percentile ↓	Systolic BP (mmHg)							Diastolic BP (mmHg)						
		← Percentile of Height →							← Percentile of Height →						
		5th	10th	25th	50th	75th	90th	95th	5th	10th	25th	50th	75th	90th	95th
11	50th	99	100	102	104	105	107	107	59	59	60	61	62	63	63
	90th	113	114	115	117	119	120	121	74	74	75	76	77	78	78
	95th	117	118	119	121	123	124	125	78	78	79	80	81	82	82
	99th	124	125	127	129	130	132	132	86	86	87	88	89	90	90
12	50th	101	102	104	106	108	109	110	59	60	61	62	63	63	64
	90th	115	116	118	120	121	123	123	74	75	75	76	77	78	79
	95th	119	120	122	123	125	127	127	78	79	80	81	82	82	83
	99th	126	127	129	131	133	134	135	86	87	88	89	90	90	91
13	50th	104	105	106	108	110	111	112	60	60	61	62	63	64	64
	90th	117	118	120	122	124	125	126	75	75	76	77	78	79	79
	95th	121	122	124	126	128	129	130	79	79	80	81	82	83	83
	99th	128	130	131	133	135	136	137	87	87	88	89	90	91	91
14	50th	106	107	109	111	113	114	115	60	61	62	63	64	65	65
	90th	120	121	123	125	126	128	128	75	76	77	78	79	79	80
	95th	124	125	127	128	130	132	132	80	80	81	82	83	84	84
	99th	131	132	134	136	138	139	140	87	88	89	90	91	92	92
15	50th	109	110	112	113	115	117	117	61	62	63	64	65	66	66
	90th	122	124	125	127	129	130	131	76	77	78	79	80	80	81
	95th	126	127	129	131	133	134	135	81	81	82	83	84	85	85
	99th	134	135	136	138	140	142	142	88	89	90	91	92	93	93
16	50th	111	112	114	116	118	119	120	63	63	64	65	66	67	67
	90th	125	126	128	130	131	133	134	78	78	79	80	81	82	82
	95th	129	130	132	134	135	137	137	82	83	83	84	85	86	87
	99th	136	137	139	141	143	144	145	90	90	91	92	93	94	94
17	50th	114	115	116	118	120	121	122	65	66	66	67	68	69	70
	90th	127	128	130	132	134	135	136	80	80	81	82	83	84	84
	95th	131	132	134	136	138	139	140	84	85	86	87	87	88	89
	99th	139	140	141	143	145	146	147	92	93	93	94	95	96	97

Blood pressure tables taken from the Fourth Report on the Diagnosis, Evaluation, and Treatment of High Blood Pressure in Children and Adolescents

BP standards based on sex, age, and height provide a precise classification of BP according to body size

**Blood Pressure Levels for GIRLS by Age and Height Percentile**

Age (Year)	BP Percentile ↓	Systolic BP (mmHg)							Diastolic BP (mmHg)						
		← Percentile of Height →							← Percentile of Height →						
		5th	10th	25th	50th	75th	90th	95th	5th	10th	25th	50th	75th	90th	95th
1	50th	83	84	85	86	88	89	90	38	39	39	40	41	41	42
	90th	97	97	98	100	101	102	103	52	53	53	54	55	55	56
	95th	100	101	102	104	105	106	107	56	57	57	58	59	59	60
	99th	108	108	109	111	112	113	114	64	64	65	65	66	67	67
2	50th	85	85	87	88	89	91	91	43	44	44	45	46	46	47
	90th	98	99	100	101	103	104	105	57	58	58	59	60	61	61
	95th	102	103	104	105	107	108	109	61	62	62	63	64	65	65
	99th	109	110	111	112	114	115	116	69	69	70	70	71	72	72
3	50th	86	87	88	89	91	92	93	47	48	48	49	50	50	51
	90th	100	100	102	103	104	106	106	61	62	62	63	64	64	65
	95th	104	104	105	107	108	109	110	65	66	66	67	68	68	69
	99th	111	111	113	114	115	116	117	73	73	74	74	75	76	76
4	50th	88	88	90	91	92	94	94	50	50	51	52	52	53	54
	90th	101	102	103	104	106	107	108	64	64	65	66	67	67	68
	95th	105	406	107	108	110	111	112	68	68	69	70	71	71	72
	99th	112	113	114	115	117	118	119	76	76	76	77	78	79	79
5	50th	89	90	91	93	94	95	96	52	53	53	54	55	55	56
	90th	103	103	105	106	107	109	109	66	67	67	68	69	69	70
	95th	107	107	107	110	111	112	113	70	71	71	72	73	73	74
	99th	114	114	116	117	118	120	120	78	78	79	79	80	81	81
6	50th	91	92	93	94	96	97	98	54	54	55	56	56	57	58
	90th	104	105	106	108	109	110	111	68	68	69	70	70	71	72
	95th	108	109	110	111	113	114	115	72	72	73	74	74	75	76
	99th	115	116	117	119	120	121	122	80	80	80	81	82	83	83
7	50th	93	93	95	96	97	99	99	55	56	56	57	58	58	59
	90th	106	107	108	109	111	112	113	69	70	70	71	72	72	73
	95th	110	111	112	113	115	116	116	73	74	74	75	76	76	77
	99th	117	118	119	120	122	123	124	81	81	82	82	83	84	84
8	50th	95	95	96	96	99	100	101	57	57	57	58	59	60	60
	90th	108	109	110	111	113	114	114	71	71	71	72	73	74	74
	95th	112	112	114	115	116	118	118	75	75	75	76	77	78	78
	99th	119	120	121	122	123	125	125	82	82	83	83	84	85	86
9	50th	96	97	98	100	101	102	103	58	58	58	59	60	61	61
	90th	110	110	112	113	114	116	116	72	72	72	73	74	75	75
	95th	114	114	115	117	118	119	120	76	76	76	77	78	79	79
	99th	121	121	123	124	125	127	127	83	83	84	81	85	86	87
10	50th	98	99	100	102	103	104	105	59	59	59	60	61	62	62
	90th	112	112	114	115	116	118	118	73	73	73	74	75	76	76
	95th	116	116	117	119	120	121	122	77	77	77	78	79	80	80
	99th	123	123	125	126	127	129	129	84	84	85	86	86	87	88

**Blood Pressure Levels for GIRLS by Age and Height Percentile (Continued)**

Age (Year)	BP Percentile ↓	Systolic BP (mmHg)							Diastolic BP (mmHg)						
		← Percentile of Height →							← Percentile of Height →						
		5th	10th	25th	50th	75th	90th	95th	5th	10th	25th	50th	75th	90th	95th
11	50th	100	101	102	103	105	106	107	60	60	60	61	62	63	63
	90th	114	114	116	117	118	119	120	74	74	74	75	76	77	77
	95th	118	118	119	121	122	123	124	78	78	78	79	80	81	81
	99th	125	125	126	128	129	130	131	85	85	86	87	87	88	89
12	50th	102	103	104	105	107	108	109	61	61	61	62	63	64	64
	90th	116	116	117	119	120	121	122	75	75	75	76	77	78	78
	95th	119	120	121	123	124	125	126	79	79	79	80	81	82	82
	99th	127	127	128	130	131	132	133	86	86	87	88	88	89	90
13	50th	104	105	106	107	109	110	110	62	62	62	63	64	65	66
	90th	117	118	119	121	122	123	124	76	76	76	77	78	79	79
	95th	121	122	123	124	126	127	128	80	80	80	81	82	83	83
	99th	128	129	130	132	133	134	135	87	87	88	89	89	90	91
14	50th	106	106	107	109	110	111	112	63	63	63	64	65	66	66
	90th	119	120	121	122	124	125	125	77	77	77	78	79	80	80
	95th	123	123	125	126	127	129	129	81	81	81	82	83	84	84
	99th	130	131	132	133	135	136	136	88	88	89	90	90	91	92
15	50th	107	108	109	110	111	113	113	64	64	64	65	66	67	67
	90th	120	121	122	123	125	126	127	78	78	78	79	80	81	81
	95th	124	125	126	127	129	130	131	82	82	82	83	84	85	85
	99th	131	132	133	134	136	137	138	89	89	90	91	91	92	93
16	50th	108	108	110	111	112	114	114	64	64	65	66	66	67	68
	90th	121	122	123	124	126	127	128	78	78	79	80	81	81	82
	95th	125	126	127	128	130	131	132	82	82	83	84	85	85	86
	99th	132	133	134	135	137	138	139	90	90	90	91	92	93	93
17	50th	108	109	110	111	113	114	115	64	65	65	66	67	67	68
	90th	122	122	123	125	126	127	128	78	79	79	80	81	81	82
	95th	125	126	127	129	130	131	132	82	83	83	84	85	85	86
	99th	133	133	134	136	137	138	139	90	90	91	91	92	93	93

Blood pressure tables taken from the Fourth Report on the Diagnosis, Evaluation, and Treatment of High Blood Pressure in Children and Adolescents

BP standards based on sex, age, and height provide a precise classification of BP according to body size

## FLUORIDE DEFICIENCY

### **NOTE:**

- The use of dietary fluoride supplements is one alternative means of providing fluoride protection to the teeth of children 6 months old to 16 years of age who consume fluoride-deficient water with 0.6 ppm fluoride or less.
- Dietary fluoride supplements, in the form of daily tablets, lozenges, liquids, or vitamin-fluoride combinations, provide systemic benefits to developing teeth as well as topical benefits to erupted teeth. When practical, supplements should be prescribed as chewable tablets or lozenges to maximize the topical effects of fluoride.
- When prescribed and used appropriately, fluoride supplements provide benefits similar to those obtained from ingesting optimally-fluoride water over the same period of time.
- **When improperly prescribed, fluoride supplements may cause mild enamel fluorosis (white spots on teeth). Therefore, systemic fluoride supplements should never be prescribed to children in fluoridated communities who are already receiving optimally fluoridated water (0.7-1.2 ppm fluoride).**
- Because of an increase in the milder forms of dental fluorosis associated with fluoride ingestion in excess of that necessary to prevent tooth decay, a conservative approach to fluoride supplementation should be used and in accordance with the recently revised guidelines.
- If a child's primary drinking water source is a well, spring, or non-fluoridated community water system, a water sample must first be taken and analyzed to determine its fluoride content and what dosage of fluoride supplement, if any, is needed.

### **SUBJECTIVE**

No other systemic source of fluoride besides that present in foods and beverages processed with fluoridated water  
 Request for dietary fluoride supplement  
 Age 6 months to 16 years

### **OBJECTIVE**

Private community water supply with a fluoride content 0.6 ppm fluoride or below as confirmed by fluoride assay  
 Dental caries are more common in areas of fluoride deficient water supply.

**ASSESSMENT**

## Fluoride Deficiency

**PLAN**

Drinking water should be analyzed for fluoride content prior to supplementation in order to determine if supplements are necessary and how much to prescribe.

To determine the level of fluoride in the child's existing water supply:

1. Obtain water sample bottles from either Fluoridation Specialist (TDEC Nashville Env. Field Office, Division of Water Supply, 711 R.S. Gass Blvd, Nashville, TN 37216, Telephone 615-687-7037 or the Regional Dental Director.
2. Provide parent or guardian with 1 water sample bottle, request slip for fluoride determination.
3. Instruct patient on the correct procedure for collecting and handling of the water sample:
  - a. Using a kitchen or bathroom faucet allow cold water to run for at least 30 seconds.
  - b. Rinse out the sample bottle twice before filling.
  - c. Fill sample bottle with cold water and screw on cap firmly.
  - d. Mail the sample within 3 days.

Estimate an effective fluoride concentration as indicated (child is consuming water from multiple sources)

**Example:** If the home water supply is tested and the fluoride concentration is 0.2 ppm, but it only accounts for half of the child's daily water intake ( $0.2 \text{ ppm} \times 0.50 = 0.1 \text{ ppm}$ ) and the day-care water supply has a known fluoride concentration of 1.0 ppm and it accounts for the remaining half of the child's daily intake ( $1.0 \text{ ppm} \times 0.50 \text{ ppm}$ ) a dietary fluoride supplement (if prescribed) should be based on the effective fluoride concentration of 0.6 ppm and not 0.2 ppm

Issue fluoride supplements according to the following dosage schedule:

**Dietary Supplemental Fluoride Dosage Schedule in mg F/day**  
**Revised, ADA Winter 1994**

Age of Child	ppm fluoride in water supply		
	0-0.3 ppm	0.3-0.6 ppm	>0.6 ppm
Birth to 6 mo	0	0	0
6 mo to 3 yrs	0.25 mg	0	0
3 to 6 yrs	0.5 mg	0.25 mg	0
6-16 yrs	1.0 mg	0.5 mg	0

Issue on a "one bottle at a time" basis

Each bottle should not exceed the recommended limit of 120 mgs of fluoride

**Health Teaching:**

There is a well-documented decline in dental caries in children in the United States which is due to widespread use of various forms of fluoride. Even people living in communities where water supplies are not fluoridated still benefit from exposure to fluorides found in toothpaste, mouth rinses, professionally applied fluorides and in foods processed in cities where water supplies are fluoridated (i.e., the “halo” phenomenon). In order to reduce risk of dental fluorosis, it is recommended that parents closely supervise tooth brushing by young children to prevent their ingestion of fluoride toothpaste and to ensure that only very small quantities (pea-sized amounts) are used. Careful use of fluoride is particularly appropriate during the time of anterior tooth enamel development (birth to 6 years).

**Follow-Up:**

The parent or guardian of the child will be asked to return for a refill when one bottle is near completion or if the fluoride status of the water supply changes.

**Reference**

MMWR August 17, 2001 / 50 (RR14) 1-42  
MMWR “Achievements....etc.” October 22, 1999 / 48 (41); 933-940

## **INVASIVE *HAEMOPHILUS INFLUENZA TYPE B*, DISEASE CONTACT**

### **Background**

Before the introduction of effective vaccines, *Haemophilus influenzae* type b (Hib) was the leading cause of bacterial meningitis in the United States among children younger than 5 years old. Widespread use of Hib conjugate vaccine has virtually eliminated invasive Hib disease in the United States and other countries where vaccination is routine. Hib is spread by direct contact with a patient's oral secretions. Hib can be spread by people who have the bacteria in their noses or throats but who do not show symptoms. The incubation period is unknown.

### **SUBJECTIVE**

Referred to Health Department with history of recent (within 1 week) contact to confirmed case of invasive *Haemophilus influenzae* type B disease and other resources for patient to purchase medication is not available

### **OBJECTIVE**

#### **Chemoprophylaxis with Rifampin Recommended**

For all household contacts in the following circumstances:

- Household with at least 1 contact younger than 4 years of age who is unimmunized or incompletely immunized

- Household with a child younger than 12 months of age who has not completed the primary Hib vaccine series

- Household with a contact who is an immunocompromised child, regardless of that child's Hib immunization status

For preschool and childcare center contacts when 2 or more cases of Hib invasive disease have occurred within 60 days

For the index patient, if younger than 2 years of age, or a member of a household with a susceptible contact and treated with a regimen other than cefotaxime or ceftriaxone.

#### **Consult with Regional Health Officer as needed for further identification/clarification of contacts needing chemoprophylaxis**

#### **Chemoprophylaxis Not Recommended**

For occupants of households with no children younger than 4 years of age other than the index patient

For occupants of households where all household contacts 12 through 48 months of age have completed their Hib immunization series and when household contacts younger than 12 months of age have completed their primary series of Hib immunization

For preschool or childcare contacts of one index case

For pregnant women

Observe for symptoms of fever, malaise, nausea, vomiting, severe headache, increased sensitivity to light, altered mental status or confusion.

#### **IF SYMPTOMATIC DO NOT PROVIDE PROPHYLAXIS, REFER IMMEDIATELY FOR DEFINITIVE DIAGNOSIS AND TREATMENT**

**ASSESSMENT**

Provide chemoprophylaxis and immunization as indicated

**PLAN****Rifampin is the drug of choice for chemoprophylaxis**

Obtain order from health department physician to issue Rifampin (for individual with no known allergy to Rifampin)

Obtain Rifampin from regional pharmacy; ask regional pharmacist to re-package tablets for adults and mix suspension for children; if necessary, Rifampin may be provided to a local pharmacist for re-packaging

**Rifampin Dosage:**

**Adults:** 600 mg/day (single dose) x 4 days, by mouth

**Children** (1 month-12 years): 20 mg/kg/day (single dose) x 4 days, not to exceed 600 mg per dose, by mouth

**Infants** (less than 1 month): 10 mg/kg/day (single dose) x 4 days, by mouth

Instruct patient regarding medication side effects and contraindications

**Immunization**

Children in the household and younger than age 5 years who are incompletely immunized against Hib disease according to the Hib immunization schedule should be administered a dose of Hib-containing vaccine and, if necessary, educated to return for the next dose when due. A single dose of Hib vaccine completes the series for any child age 15 months through 59 months.

**Health Teaching**

Advise barrier method (foam and condoms) for oral contraceptives

Advise contact lens wearers that tears will be orange and stain contacts; urine may be orange

Notify Regional Health Officer, Communicable Disease Director and Nursing Supervisor

**Referral Indicators:**

Symptomatic for meningitis

Unable to tolerate, or allergy to, Rifampin

**REFERENCES**

CDC. Meningitis – Bacterial

[www.cdc.gov/meningitis/bacterial](http://www.cdc.gov/meningitis/bacterial)

American Academy of Pediatrics. Haemophilus influenzae infections. In: Pickering, LK, Baker CJ, Kimberlin DW, Long SS, eds. *Red Book: 2012 Report of the Committee on Infectious Diseases*. Elk Grove Village, IL: American Academy of Pediatrics; 2012:345-352.

Epidemiology and Prevention of Vaccine- Preventable Diseases, Department of Health and Human Services, Centers for Disease Control and Prevention, 12<sup>th</sup> Edition, May 2011  
Manual for Surveillance of Vaccine-Preventable Diseases, Centers for Disease Control and Prevention, 5<sup>th</sup> Edition, 2012

Yeh, S. Prevention of Haemophilus influenza infection. In: UpToDate, Torchia, M (Ed), Waltham, MA, 2013

## **MENINGOCOCCAL, INVASIVE DISEASE, Contact**

### **BACKGROUND**

Invasive infections with *Neisseria meningitidis* may present as meningococemia (an infection of the bloodstream), meningococcal meningitis (inflammation of the protective membranes that cover the brain and spinal cord), or both. Invasive meningococcal disease is rare (about 1,000 cases occur in the United States each year) and serious. About 10% of cases die. Among survivors, 11-20% suffer neurologic damage or loss of limbs. Invasive meningococcal disease is spread person to person through exchange of respiratory and throat secretions such as coughing, kissing or sharing eating utensils. The incubation period of meningococcal disease is 1-10 days, usually less than 4 days. Meningococcal vaccines cannot prevent all cases of meningococcal disease and is not a factor in decisions concerning chemoprophylaxis of contacts.

### **SUBJECTIVE**

Referred to Health Department with history of exposure to confirmed case of invasive meningococcal disease within 7 days of onset of disease in the index case and less than 2 weeks after exposure and other resources not available for patient to purchase medication.

### **OBJECTIVE**

#### **Chemoprophylaxis recommended (high risk)**

Chemoprophylaxis is indicated for the following close contacts, ideally within 24 hours of diagnosis of *Neisseria meningitidis* invasive disease in the index case, but *not* more than 2 weeks after exposure.

- Household members, roommates, intimate contacts in the 7 days prior to disease onset
- Child care or preschool contacts any time during 7 days before onset of illness
- Direct exposure to index patient's oral secretions through kissing or through sharing toothbrushes, cigarettes, drinks or eating utensils, markers of close social contact, at any time during 7 days before onset of illness.
- Mouth-to-mouth resuscitation, *unprotected* endotracheal intubation or endotracheal tube management during 7 days before onset of illness
- People who frequently slept in the same dwelling as index patient during 7 days before onset of illness
- Passengers seated directly next to the index patient during airline flights lasting more than 8 hours

#### **Consult with Regional Health Officer as needed for further identification/clarification of contacts needing chemoprophylaxis**

Observe for symptoms of fever, malaise, nausea, vomiting, severe headache, increase sensitivity to light, altered mental status or confusion

#### **IF SYMPTOMATIC, DO NOT PROVIDE PROPHYLAXIS, REFER IMMEDIATELY FOR DEFINITIVE DIAGNOSIS AND TREATMENT**

## ASSESSMENT

Provide chemoprophylaxis as indicated

## PLAN

Obtain order from health care provider to issue Rifampin (no known allergy to Rifampin)

Obtain Rifampin from regional pharmacy; ask regional pharmacist to repackage tablets for adults and mix suspension for children

**Rifampin:**     **Adults:** 600 mg every 12 hours x 2 days  
                  **Children: (1 month-12 years)** 10 mg/kg/dose every 12 hours x 2 days not to exceed 600 mg/dose  
                  **Infants: (less than 1 month)** 5 mg/kg/dose every 12 hours x 2 days

**Ciprofloxacin:** 500 mg STAT dose may be issued or prescribed as an alternate treatment for persons **over age 18** years

## Health Teaching

Counsel patient that chemoprophylaxis is not 100% protective, review the signs and symptoms of meningococcal disease (sudden onset of fever, chills, malaise, muscle pain or a rash), advise to seek immediate medical attention should these signs develop.

Instruct patient regarding side effects and contraindications of chemoprophylaxis

Advise barrier method (foam, film or condoms) for oral contraceptive clients

Advise that tears will be orange and stain contacts lenses; urine may be orange

Notify regional health officer, communicable disease director and nursing supervisor

Should check to see that index case received Rifampin post treatment to eradicate upper respiratory tract colonization of organism

## Referral Indicators:

Symptomatic for meningitis

Unable to tolerate Rifampin

## REFERENCES

American Academy of Pediatrics. Meningococcal infections. In: Pickering, LK, Baker CJ, Kimberlin DW, Long SS, eds. *Red Book: 2012 Report of the Committee on Infectious Diseases*. Elk Grove Village, IL: American Academy of Pediatrics; 2012:500-509.

CDC. Meningococcal Disease

[www.cdc.gov/meningococcal/about/symptoms.html](http://www.cdc.gov/meningococcal/about/symptoms.html)

Epidemiology and Prevention of Vaccine-Preventable Diseases, Department of Health and Human Services, Centers for Disease Control and Prevention, 12<sup>th</sup> Edition, May 2011

Immunization Action Coalition, Meningococcal: Questions and Answers Information about the disease and vaccines, March 2012

<http://www.immunize.org/catg.d/p4210.pdf>

Kaplan SL, & Pentima CD. Meningitis in Children Beyond the Basics, In: UpToDate, Torchia, MM (Ed), Waltham, MA, 2013

Red Book, Report of the Committee on Infectious Diseases, 29<sup>th</sup> Edition, 2012

## **TUBERCULOSIS, CASE OR SUSPECT (INITIAL VISIT)**

### **SUBJECTIVE**

Symptoms may include the following:

Cough >2 weeks	Chills
Hemoptysis	Night sweats
Chest pain	Weight loss
Fever	Fatigue
Referral from physician	

### **OBJECTIVE**

Productive cough	Respirations normal or labored
Thin, pale	Documented weight loss
HIV status	Jaundice, yellow eyes
Positive or negative tuberculin skin test (TST)	
Positive, negative or indeterminate IGRA (Indeterminate should be repeated)	
Positive or negative smear, cultures, or culture pending	
Abnormal chest X-ray	
Other diagnostic tests/results	

Baseline measurement from TB clinic to include CMP, CBC with platelets and differential, and HIV. (Routine laboratory monitoring for toxicity is generally not needed in individuals with normal baseline.)

Clinical information from other providers, hospital

### **ASSESSMENT**

Tuberculosis suspect (culture report not available)

Tuberculosis case (culture report or nucleic acid amplification test result is positive, indicate site of infection)

Latent Tuberculosis Infection (LTBI)

### **PLAN**

**Have patient wear surgical mask if symptomatic; nurse must wear n-95 mask**

#### **Initial Nursing Assessment:**

Face to face contact will be made within 24 hours of notification of new infectious (sputum smear positive or cavitory on chest x-ray) TB suspect/case; this contact may be in the home, office, hospital, or other facility

Explain contact investigation and begin identifying contacts

Face to face contact visit will be made within 3 working days of notification of a newly diagnosed case or suspect who is:

- sputum smear negative,
- culture pending or culture positive,
- abnormal chest x-ray non-cavitary

Records should be obtained within 24 hours of report of suspect

**Conduct Home Assessment:**

If the initial visit is not a home visit, nurse should make a home visit to assess the home environment within 3 working days from notification; preferably the home visit should be made prior to patient's discharge from hospital, but no later than 24 hours after discharge from a hospital (see TB Guidelines)

Nurse must ensure that no immunosuppressed persons or children <4 years of age are in the home if an infectious patient is being discharged home

**Provide Screening Evaluation:**

Consider psychosocial, cultural background, and language/literacy level

Provide interpreter services as needed

Complete TB/LTBI Risk Assessment Tool (if not done previously) and evaluate history, including onset and duration of symptoms and signs for TB (as listed above)

Evaluate for possible pregnancy

Screen for any contraindications to anti-tuberculosis drugs (using PH 2040, Screening and Monitoring Forms)

Observe patients and family's ability and availability of resources to cope, adherence to medications regimen, and compliance with follow-up

If being treated by private physician, obtain record of physical exam, chest X-ray report, significant lab tests (sputum cultures, liver functions, and WBC) and medication orders

Ascertain whether MD will follow or if Health Department to follow; if Health Department to follow, refer to TB Clinic

Assure that a focused physical exam and chest X-ray have been performed by TB clinic MD/NP; if not done, refer back to TB clinic

Begin contact investigation

If patient is hospitalized, notify hospital of isolation discharge requirements

If patient is discharged from hospital, obtain and send copy of all records (notes, lab, and radiology reports, physician orders, and medication sheets) to regional TB clinic

**Obtain and Document the Following Information:**

Physician referral of suspect, case, or orders for anti-TB drugs

Known contacts

HIV status/other TB risk factors

PPD skin test history (including measurement) or previous IGRA test (including dates and results)

Previous history of –

Tuberculosis disease

TB infection (LTBI)

Administration of anti-TB medications

Symptoms including –

Date of first symptom

Weakness, weight loss, anorexia

“Flu-like” episode, chills, fever

Productive cough, chest pain, blood in sputum

Night sweats

Other health problems including –

HIV or immunosuppression

Diabetes mellitus

Liver or kidney disease

History of alcohol or drug abuse

Current medications (including OTCs and herbal medicines)

LMP

Allergies

Other evaluation by private MD, other providers, or health care facility

Special patient needs

**Treatment:**

Instruct on home isolation precautions until no longer infectious, or place patient on isolation if indicated

Measure height, weight, and vital signs initially.

Obtain weight and vital signs monthly

**Directly observed therapy (DOT) is the standard of care for all TB cases**

Issue anti-tuberculosis drugs as prescribed by TB clinic physician (only those medications approved by TB clinic MD may be issue)

If on ETHAMBUTOL perform visual acuity (Snellen chart) and Red/Green color discrimination monthly; if patient wears glasses, check vision with glasses and note this in record

If STREPTOMYCIN or an AMINOGLYCOSIDE (Capreomycin, Amikacin) is to be used, obtain BUN and creatinine; patient should be questioned at baseline and monthly about possible hearing loss or tinnitus, and monitor vestibular function using the Romberg at baseline and monthly

At treatment initiation, if not drawn in TB clinic, draw CMP, CBC with platelets and differential

and HIV (if not known); all labs to be reviewed by **the TB** physician  
 Issue 3 sputum containers, dated and numbered (if pulmonary TB or to rule out pulmonary TB)  
 with instructions for collecting in AM  
 Collect first sputum specimen in clinic in person by sputum induction using 3% sodium  
 chloride.  
 Issue patient 2 pre-labeled and dated cans for use the next 2 consecutive days for natural sputum  
 collection  
 Complete all required fields on lab requisition  
 DOT worker should pick up sputums at home on the day of collection for mailing to the lab from  
 the local health department

### **Perform Contact Investigation (see TB Guidelines)**

All high-risk contacts should be tested within 7 working days  
 Completion of initial medical assessments of high-risk contacts should be completed within 10  
 working days of contact identification.  
 Document all contact information on PH 1631, "TB Contact Record"

NOTE: IGRA test is preferred for baseline testing for contacts  $\geq 5$  years of age.  
 All contacts should receive an IGRA or TST if they have a documented negative PPD or IGRA  
 history.

All high-risk contacts (from all environments) that have a positive IGRA or Positive TST are to  
 have a chest X-ray and evaluation by an MD or APN.  
 Contacts that have an initial negative TST or IGRA but are at risk of progression to active TB  
 (i.e., children < 4, immunosuppressed persons, pregnant women, dialysis patients, HIV+, etc.)  
 are to have a chest X-ray and evaluation by an MD or APN as soon as possible.

All contacts with an initial negative IGRA or TST should have a repeat IGRA or TST at 8-10  
 weeks after contact is broken (last exposure) with the suspect/case; only one IGRA or TST is  
 needed if contact has been broken for more than 10 weeks when initially tested.

NOTE: Use consistent method of testing for evaluation of a contact

Example:

- if IGRA is drawn initially, then at 8-10 weeks, IGRA will be repeated
- if Tubersol PPD is placed initially, then at 8-10 weeks, a second PPD will be placed  
 using Tubersol
- if Aplisol PPD is placed initially, then at 8-10 weeks, a second PPD will be placed  
 using Aplisol

Any contact that has an **indeterminate** IGRA is to be retested within 1-2 weeks.

Consult with regional TB nurse/physician for preventative therapy on ALL children who are  
 close contacts of infectious or potentially infectious cases of TB, regardless of skin test results.

Document on contact record (PH 1631).

When contact investigation is completed, send a copy of PH 1631 to Regional TB office.

### **Provide Follow-up**

If patient is being followed by Health Department TB physician, schedule monthly return appointments to TB clinic.

If patient is being followed by a private provider, schedule monthly visit with PHN to issue medication(s) and document any medication side effects.

Obtain monthly office visit medical record notes from private provider prior to monthly PHN visit at health department.

For patients with active TB:

- Ensure DOT as ordered by **physician** until regimen is completed
- Assess for side effects each time DOT is given
- Weigh at every TB clinic visit
- Ensure baseline labs and sputum culture results are in chart
- Report any symptoms suggesting toxicity promptly to the treating **physician** and obtain appropriate lab specimens as ordered
- If on ETHAMBUTOL, perform monthly vision checks including visual acuity and color red/green discrimination
- If on STREPTOMYCIN or an AMINOGLYCOSIDE (Capreomycin, Amikacin), perform monthly Romberg and hearing evaluation (see TB Guidelines)
- Repeat liver testing if indicated (underlying liver disease, alcohol use symptoms) or as ordered by physician
- Issue sputum containers (set of 3) at least monthly but should be more frequently if patient is infectious; three sputum cultures must be obtained at one month and two months as ordered **by physician** (document reason if unable to obtain and notify Regional TB clinic), remind physician to order at 2 months if not done
- Sputum cultures must be done every month until patient has 3 consecutive negative cultures for 2 consecutive months
- When culture sent to outside labs, contact private provider or lab to ensure culture and sensitivity are ordered and that culture isolate is sent to state lab
- Send a copy of completed drug monitoring sheet to the regional TB clinic monthly
- Ensure TB clinic is aware of all culture and sensitivity results

### **Provide Referral:**

- Current medication intolerance and/or adverse reactions
- Abnormal laboratory findings
- Pregnancy
- Non-adherence

## REFERENCES

- CDC. Core curriculum on TB: What the Clinician Should Know, 5<sup>th</sup> Ed., 2011.
- CDC. [Guidelines for the Investigation of Contacts of Persons with Infectious Tuberculosis: Recommendations from the National Tuberculosis Controllers Association and CDC](#) *MMWR* 2005; 54 (No. RR-15, 1-37)
- CDC. [Guidelines for Using the QuantiFERON–TB Gold Test for Detecting \*Mycobacterium tuberculosis\* Infection, United States](#) *MMWR* 2005; 54 (No. RR–15, 1–37)
- CDC. Mantoux Tuberculosis Skin Testing Facilitator Guide.  
<http://www.cdc.gov/tb/education/Mantoux/part2.htm>
- CDC. Targeted tuberculin testing and treatment of latent tuberculosis infection. *MMWR* 2000;49:1-51.
- CDC. [Updated Guidelines for Using Interferon Gamma Release Assays to Detect \*Mycobacterium tuberculosis\* Infection — United States, 2010](#) *MMWR* 2010; 59 (RR-5); 1-25
- Reichman LB, and Hershfield ES, eds. Tuberculosis: A Comprehensive International Approach, 2000; Vol. 144.
- Report of the Committee on Infectious Diseases.* Elk Grove Village, IL
- Tennessee Department of Health Tuberculosis Guidelines, 2004

## RABIES VACCINE, PRE-EXPOSURE

Preexposure vaccination and post-vaccination serology and booster vaccination are generally not given by health department personnel. If provided, the Regional Health Officer or Regional Medical CEDS Director should be notified to approve administration prior to the health department implementation.

### General Information

Appropriate candidates for the primary course of pre-exposure rabies vaccination include those persons who are associated with a professional or recreational activity that places them at risk for contact with rabies virus according to the recommendations of the Advisory Committee on Immunization Practices (ACIP).

Persons considered to be at **continuous risk** (e.g., rabies research laboratory workers, rabies biologics production workers) are advised to receive the primary course and have serologic testing every 6 months. A booster vaccination is given if antibody titer is below the acceptable level as reported by the laboratory.

Persons considered to be at **frequent risk** (e.g., spelunkers, veterinarians and staff and animal-control and wildlife workers in rabies-enzootic areas) are advised to receive the primary course and have serologic testing every 2 years. A booster vaccination is given if antibody titer is below the acceptable as reported by the laboratory.

Persons considered to be at **infrequent risk** (e.g., Veterinarians and animal-control and wildlife workers in areas with low rabies rates, veterinary students, travelers visiting areas where rabies is enzootic and immediate access to appropriate medical care including biologics is limited) should receive the primary course. No serologic testing or booster vaccination is recommended.

According to current ACIP guidelines post-vaccination serology and booster vaccination for persons at continuous or frequent rabies risk are indicated. Serology should be based on rapid fluorescent focus inhibition test (RFFIT). RFFIT testing and submission guidelines are available from:

- Kansas State University College of Veterinary Medicine Rabies Laboratory (785-532-4483), <http://www.vet.ksu.edu/DEPTS/dmp/service/rabies/rffit.htm>
- Atlanta Health Associates (770-205-9091 or 800-717-5612), <http://www.atlantahealth.net/>

A booster is indicated if the titer is less than complete neutralization at a 1:5 serum dilution by the RFFIT as reported by the testing laboratory. Contact the State Public Health Veterinarian for additional consultation.

**VACCINATION PLAN FOR PRIMARY COURSE (PREVIOUSLY UNVACCINATED):**

- Review patient history for pre-exposure vaccination or post-exposure prophylaxis and contraindications (previous severe reaction, pregnancy, concurrent use of chloroquinemphosphate for malaria prophylaxis, immunosuppression)
- Reconstitute vaccine per manufacturer's directions.
- Administer 1 ml of rabies vaccine (Human Diploid Cell Vaccine [HDCV / Imovax] **or** Purified Chick Embryo Cell Vaccine [PCEC / RabAvert]) on days 0, 7, 21 or 28; given IM per manufacturer's directions
- Instruct patient to remain in clinic for 20 minutes following vaccination (observe for possible reaction)

**Health Education:**

Discuss adverse reactions such as mild to moderate inflammatory reactions, as well as infrequent mild systemic reactions such as headache, nausea, abdominal pain, muscle aches, dizziness

Be sure that the client understands the importance of keeping return appointment dates  
Return for 2nd (day 7) and 3rd dose (day 21 or 28) according to schedule

**PLAN FOR SEROLOGY AND BOOSTERS (PREVIOUSLY VACCINATED):**

- Review patient history for pre-exposure vaccination or post-exposure prophylaxis.
- Conduct and review results of RFFIT. Guidance on submission of serum should be obtained from the laboratory performing the test or the Tennessee State Public Health Veterinarian.
- If a booster is indicated, review contraindications (previous severe reaction, pregnancy, concurrent use of chloroquine phosphate for malaria prophylaxis, immunosuppression)
- Reconstitute vaccine per manufacturer's directions.
- Administer 1 ml of rabies vaccine (Human Diploid Cell Vaccine [HDCV / Imovax] **or** Purified Chick Embryo Cell Vaccine [PCEC / RabAvert]) on day 0; given IM per manufacturer's directions
- Instruct patient to remain in clinic for 20 minutes following vaccination (observe for possible reaction)

**Health Education:**

Discuss adverse reactions such as mild to moderate inflammatory reactions, as well as infrequent mild systemic reactions such as headache, nausea, abdominal pain, muscle aches, dizziness

**References:**

2006 Red Book, Report of the Committee on Infectious Diseases, American Academy of Pediatrics

Rabies Prevention - United States, 1999, Recommendations of the Immunization Practices Advisory Committee (ACIP), U.S. Department of Health and Human Services, Centers for Disease Control, MMWR, January 8, 1999/Vol. 48/No. RR-1.

## CHLAMYDIA TRACHOMATIS, CONTACT PARTNER DELIVERED THERAPY

**NOTE:** *In 2002 the Board of Medical Examiners and the Board of Osteopaths adopted an amendment to the medical practice act allowing providers and those who provide medical services under their responsibility and control to use partner delivered therapy.*

**The following protocol should be implemented as an important DISEASE CONTROL STRATEGY and in accordance with CDC recommendations.**

### **SUBJECTIVE**

Partner delivered therapy is for those contacts to index cases of chlamydia who are unlikely to seek medical care.

### **OBJECTIVE**

A laboratory confirmed Chlamydia infection without evidence of co-infection with gonorrhea or other complications suggestive of a relationship to Chlamydia infection

Provision of treatment of the (index) patient for Chlamydia

An attempt to persuade the infected patient to have all partners evaluated and treated and indication from the patient that partner(s) would not comply

### **PLAN**

Document objective findings in index patient's record.

Provide a Chlamydia fact sheet to the patient with copies for all partners.

<http://www.cdc.gov/std/chlamydia/chlamydia-fact-sheet.pdf>

<http://www.nlm.nih.gov/medlineplus/druginfo/meds/a697037.html>

Counsel the patient on sexual abstinence for seven days after treatment and until seven days after partners have been treated.

Provide to the treated patient a non-named signed (MD or NP) prescription(s) or a signed, name-specific prescription(s) **OR**

Issue to the treated patient 1 gram of azithromycin for each of the unnamed sex partners or for each of the total number of known sex partners named by the patient.

Refer to PHN Protocol 5.010 for Chlamydia Case or Contact for treatment and counseling.