



PROVIDENCE
COLLEGE

STOP THE SWAP!

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Providence College

28 October 2015

Objectives

1. Explain the steps needed to be taken once a confirmed case of meningitis occurs on a college campus.
2. Discuss how a vaccination program was instituted at Providence College.
3. Outline the “Stop the Swap Campaign” at Providence College.
4. Discuss how a student presents with signs and symptoms of meningitis.

How Health Services Responded

Day 1: February 1, 2015

- 3:00pm- College was notified of suspected case of bacterial meningitis
- 3:15pm- Director of Health Services notified
- Name, YOG, residence of student
- Contacted Emerson Hospital
- Parents of Case #1 contacted
- College chaplain notified
- Called MGH

Case #1 Presentation 2/1/15

Signs and symptoms:

- 1 week coryza like illness
- Headache for 12 hours prior to hospital admission
- Restlessness and severe headache on morning of hospitalization

Day 1: February 1, 2015....continued

- Fielded calls from parents of dorm/classmates
- Contacted hall director on duty
- Informed campus EMT's of case
- Contacted Health Services M.D.

Day 1: February 1, 2015....continued

- Floor meeting in Health Services
- Individual confidential interviews of close contacts
- Prophylaxis of contacts with Cipro
- "Know the Facts About Meningitis"
- The Perfect Storm.....

Day 2: February 2, 2015

SNOW DAY!



- Contacted RIDOH- 9am sharp!
- Continuous updates to VPSA and Dean of Students
- Need to know updates to Campus Public Relations
- Fielded non stop calls from parents
- Additional interviews of close contacts

Day 2: February 2, 2015....continued

- Campus wide Health Advisory distributed via email
- Public relations coordinated with RIDOH on first press release
- First media inquiry by RI Public radio station
- Updated website

Day 3: February 3, 2015

- Email update from family of Case #1
- Fielding calls from students, parents, pcp's
- Updates to VPSA
- Communication with DOH
- Informed academic dean

Day 4: February 4, 2015

- Surveillance site for 21 days
- Updates to website
- Remained in contact with parent of Case #1
- Calm before storm.....

Day 5: February 5, 2015

Case #2 Presentation

- 9:15am - Mother contacted health services
 - 9:00pm 2/4/15: abrupt onset of chills, malaise, coryza
 - 3:00am 2/5/15: vomiting and diarrhea
- 9:45am - Student evaluated in Health Services
 - PE: BP 70/p HR 150 Temp 98.0 O2 sat 94%
 - Purpura on arms and trunk
 - Lethargic

Day 5: February 5, 2015....continued

- Assessment of septicemia; likely Neisseria meningitidis
- 911 called
- Health Services waiting area cleared
- RIH ER contacted

Day 5: February 5, 2015....continued

- Contacted student's mother
- Contacted VPSA
- Contacted RIDOH
- Contacted chaplain

Day 5: February 5, 2015....continued

- 10:00am- Contacted roommate
- Roommate evaluated/prophylaxed at Health Services
- Contacted Res Life
- Roommate relocated to another residence
- Sibling/PC student was contacted by mother to report to Health Services for eval/prophylaxis
- Sibling brought to RIH by PC chaplain

Day 5: February 5, 2015....continued

- Director of campus emergency management notified
- 11:35am- Contacted by College president
- Medical staff prophylaxed
- Close contacts notified
- Individual confidential interviews

Day 5: February 5, 2015....continued

- DOH confirms Case #1 Serogroup B
- Plans for mass vaccination clinic announced
- Princeton University contacted
- Website updated
- DOH/PC news release

Day 5: February 5, 2015....continued

- 8:00pm- DOH Medical Director information session on campus
- Second campus wide Health Advisory
- Multiple media inquiries
- Health Services extends hours 24/7

Day 6: February 6, 2015

- Case #2 critical condition RIH ICU
- Case #1 family contacts Health Services with update
- Additional EMT coverage
- Phone bank set up/standard response
- 3 students sent to RIH for evaluation

Day 6: February 6, 2015....continued

- STOP THE SWAP campaign!
- Posters
- Email to faculty /staff
- Clinic preparations

STOP THE SWAP



Your risk for meningococcal meningitis increases if you are exposed to the bacteria that causes it. Sharing things like lip balm, kisses, common source punch bowls, food, eating utensils, water bottles, cups, cigarettes, or any other type of saliva transference can spread the meningococcal disease. A person can be a carrier of meningitis without any symptoms, so remember to

**STOP the
SWAP.**

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Clinic Preparations:

Forms:

- Meningitis/vaccine information
- Vaccine administration record
- Consent/Declination
- Under 18

Logistics:

- Facility
- Medicine refrigerator
- Food
- Volunteers
- DMAT



PROVIDENCE
COLLEGE

Meningococcal Vaccination Waiver Form Fall, 2015

Name: _____ Student ID: _____ Class Year: _____
Last First MI
Email: _____ Phone: _____ Date of Birth: _____
mm/dd/yyyy

The information below includes the risk factors and dangers of the diseases as well as the information on the availability and effectiveness of the respective vaccines for persons who are at risk for the diseases. The information concerning these diseases is from the Rhode Island Department of Health (HEALTH) and the Centers for Disease Control and Prevention (CDC).

What causes meningococcal disease and how does the disease spread?

Meningococcal meningitis is an infection of the lining that surrounds the brain and spinal cord. The bacterial infection is spread through direct secretions from the nose or mouth through activities such as kissing, or sharing food, drinks, water bottles, toothbrushes, eating utensils, or cigarettes. Meningococcal disease can be treated with antibiotics, but quick medical attention is extremely important.

What are the symptoms?

Meningitis may present as sudden onset of fever, headache, and stiff neck. It will often have other symptoms, such as nausea, vomiting, increased sensitivity to light and altered mental status and/or a skin rash. The symptoms of bacterial meningitis can appear quickly or over several days. Typically they develop within 3-7 days of exposure.

Is there a vaccination?

Yes, there are several; however, the Rhode Island Department of Health (HEALTH) and the Center for Disease Control and Prevention (CDC) Health officials notified the College that the meningitis vaccination, which most students received prior to coming to campus in September 2014, is not effective in protecting against the Serogroup B strain of meningitis.

Election to Receive the Meningococcal Meningitis, Serogroup B Vaccination

_____ I hereby certify that I have read the above information and I have elected to receive the vaccine for Meningococcal Meningitis, Serogroup B

_____ I hereby certify that I have read the above information and I have elected NOT to receive the vaccine for Meningococcal Meningitis, Serogroup B.

Signature of Student (or Parent/Guardian if student is under 18): _____

Date: _____

For more information about Meningococcal Meningitis, go to www.cdc.gov or www.health.ri.gov

Providence College Meningococcal B Vaccine (Trumenba®) Administration Record and Consent			
PATIENT INFORMATION			
Name: (Last) _____ (First) _____ (MI) _____	Date of Birth _____/_____/_____ <small style="margin-left: 100px;">MM DD YYYY</small>		
Sex: <input type="checkbox"/> Male <input type="checkbox"/> Female			
<input type="checkbox"/> Undergraduate student <input type="checkbox"/> Graduate student <input type="checkbox"/> Faculty or staff <input type="checkbox"/> Other: _____			
Permanent Home Address:			
Street	City	State	Zip Code
Current Local Address: (include Residence Hall information):			
Phone Numbers:		Email Address:	
Cell: (____)_____-_____			
Home: (____)_____-_____			
Emergency Contact Name:		Relationship to you:	
Phone number: (____)_____-_____			
MEDICAL SELF-ASSESSMENT/SCREENING			
Please complete the self-assessment on the reverse side. Both you and a clinical staff member will review this document prior to receiving the vaccine.			
MENINGOCOCCAL B VACCINE (TRUMENBA®) ADMINISTRATION CONSENT			
<input type="checkbox"/> I have read the Meningococcal B Vaccine (Trumenba®) vaccine information form created by Pfizer (v. 11-2014) <input type="checkbox"/> I have had the opportunity to review the full prescribing information for Meningococcal B Vaccine (Trumenba®) (v. 10-2014) <input type="checkbox"/> I have had the opportunity to ask questions about Meningococcal B Vaccine (Trumenba®) that were answered to my satisfaction <input type="checkbox"/> I understand that three doses of Meningococcal B Vaccine (Trumenba®) are required to complete the recommended series <input type="checkbox"/> I understand the potential benefits and risks of receiving the Meningococcal B Vaccine (Trumenba®) vaccine and request that it be given to me			
Patient/Guardian Signature: _____ Date: _____			
VACCINE ADMINISTRATION (To be completed by clinical staff only)			
Manufacturer: Pfizer		Lot Number: _____	
Administration site: Deltoid R L		Expiration Date: _____/_____/_____ <small style="margin-left: 100px;">MM DD YYYY</small>	
Time: _____:_____AM/PM			
Name of Vaccine Administrator:			
Print: _____ Signature: _____ Date: _____/_____/_____ <small style="margin-left: 100px;">MM DD YYYY</small>			



Time Given _____

Meningitis B Vaccination
Providence College

Name: _____

Date of Birth: _____

Vaccine: Trumenba

Manufacturer: Pfizer

	Dose 1	Dose 2	Dose 3
Date			
Lot number			
Expiration date			
Vaccine information statement provided?			

You will not be fully vaccinated against meningitis B until you receive three doses of vaccine. Please share this information with your healthcare provider.

*****Please see back of card for common side effects*****

Today you received Trumenba which is a vaccine indicated for active immunization to prevent disease caused by *Neisseria meningitidis* serogroup B.

COMMON adverse reactions to vaccines are:

- *pain/swelling/redness at the injection site**
- *fatigue**
- *headache**
- *muscle pain**
- *low grade fever/chills**

While these are **NORMAL** reactions and to be expected for approximately 24-72 hours post vaccination, feel free to contact health services (401-865-2422) or the EMT's (401-865-2888) with any questions or concerns.

REMINDER:

Health Services hours of operation are Monday-Friday (8am-5pm)

EMT's are available Monday-Friday (4:30pm-8:30am) and Saturday and Sunday (24 hours)

On Sunday, August, 30 and Saturday, September 5th, health services will be **OPEN 24 hours**

For additional information please visit:

www.trumenba.com

www.cdc.gov

www.health.state.nj.us

<http://www.providence.edu/health-center/meningitis>

Day 6: February 6, 2015....continued

- Campus wide email from VPSA to students/parents/faculty/staff
- NBC-10 local nightly news filming on campus
- 4:00pm- DOH Medical Director comes to campus for faculty/staff
- Vaccination planning committee meeting

STOP THE SWAP!

Day 7: February 7, 2015

- Per diem admin support in health services
- Schedule for vaccination clinic posted:
email/website/residence halls/ Twitter, PC
Facebook
- Public relations communications:
television/radio/newspaper
- 3:00pm- DOH Medical Director comes again!
Q/A for students

STOP THE SWAP!

Day 8: February 8, 2015

POD staffing:

- Dir. Of Emergency Management
- Health Services staff; Director and M.D.
- Volunteers; faculty and staff
- Vaccinators; DMAT and DOH
- DMAT
- DOH
- Pharmaceutical representative

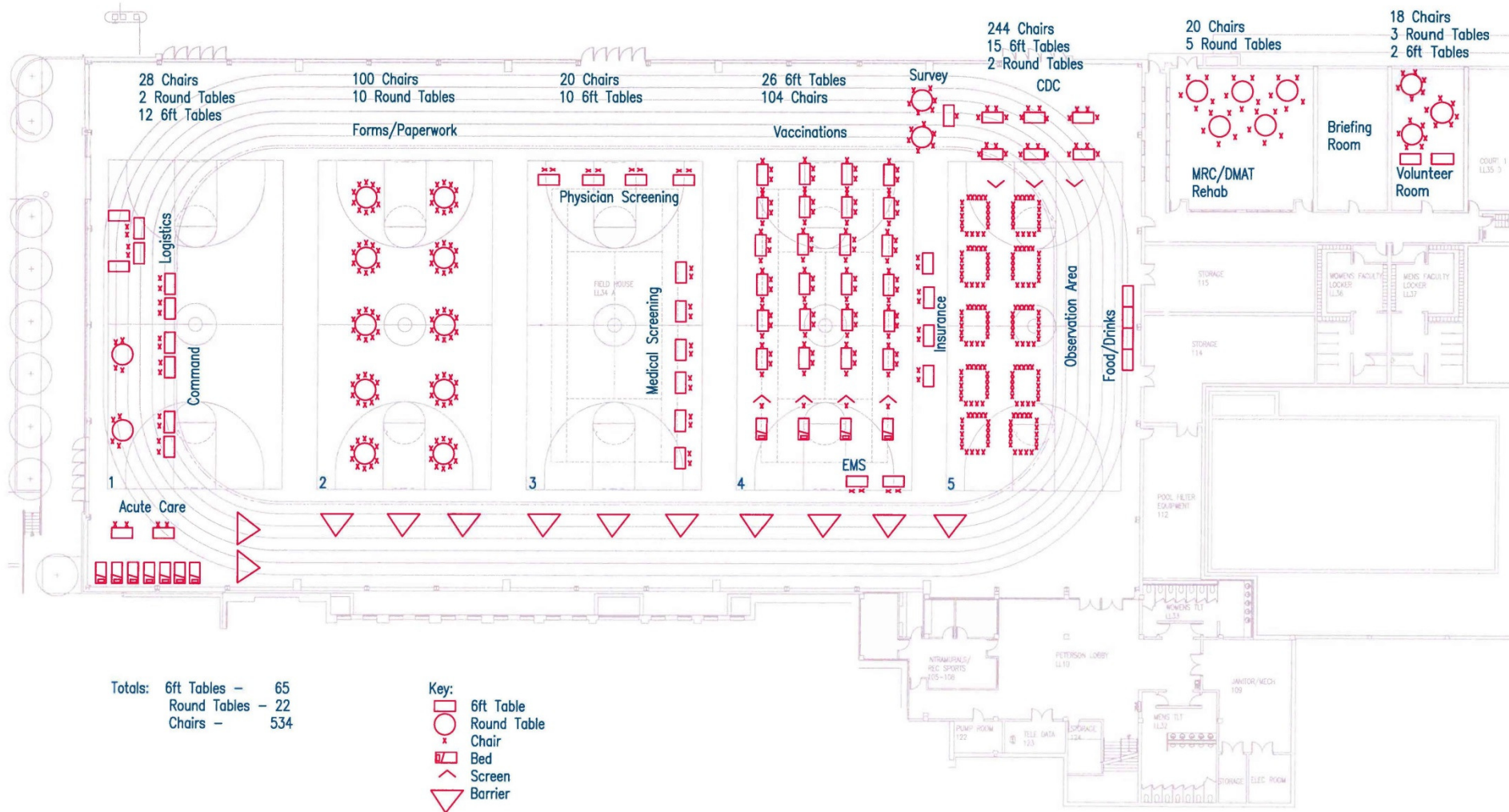
STOP THE SWAP!

Day 8: February 8, 2015....continued

POD set up:

- Swipe in
- Paperwork
- Forms reviewed
- Vaccination
- Post vaccination waiting area/check out
- Observation area

STOP THE SWAP!



Day 8: February 8, 2015....continued

Men B clinic #1:

- 4:00am- Clinic set up
- 8:00am- Briefing (DMAT, DOH, Health Services)
- 8:30am- Briefing (Volunteers)

STOP THE SWAP!

February 2015

Those eligible to receive the vaccine:

- 2,860 students living on campus
 - 763 students living off campus
 - 141 commuter students
 - 76 grad students under age 25
 - 26 faculty/staff under age 25
 - Less 121 study abroad
-
- TOTAL...3,745 eligible to be vaccinated

STOP THE SWAP!

Day 8: February 8, 2015....continued

Men B clinic #1

- Vaccination, no cost to students
- Assigned clinic arrival times
- 9:00am-6:00pm clinic in recreation center
- Vaccinated 3,061
- Largest one day clinic ever held in the state

STOP THE SWAP!

Day 8: February 8, 2015....continued

Post vaccination clinic:

- Very busy in Health Services
- Common adverse reactions to vaccine
- VAERS forms

STOP THE SWAP!



VACCINE ADVERSE EVENT REPORTING SYSTEM

24 Hour Toll-free Information line 1-800-822-7987

P.O. Box 1100, Rockville, MD 20849-1100

PATIENT IDENTITY KEPT CONFIDENTIAL

For CDC/FDA Use Only

VAERS Number _____

Date Received _____

Patient Name: Last _____ First _____ MI. _____ Address _____ City _____ State _____ Zip _____ Telephone no. (____) _____		Vaccine administered by (Name) _____ Responsible Physician _____ Facility Name/Address _____ City _____ State _____ Zip _____ Telephone no. (____) _____		Form completed by (Name): _____ Relation <input type="checkbox"/> Vaccine Provider <input type="checkbox"/> Patient/Parent to Patient <input type="checkbox"/> Manufacturer <input type="checkbox"/> Other Address (if different from patient or provider) _____ City _____ State _____ Zip _____ Telephone no. (____) _____	
1. State	2. County where administered	3. Date of birth mm / dd / yy	4. Patient age	5. Sex <input type="checkbox"/> M <input type="checkbox"/> F	6. Date form completed mm / dd / yy
7. Describe adverse event(s) (symptoms, signs, time course) and treatment, if any				8. Check all appropriate: <input type="checkbox"/> Patient died (date mm / dd / yy) <input type="checkbox"/> Life-threatening illness <input type="checkbox"/> Required emergency room/doctor visit <input type="checkbox"/> Required hospitalization (____ days) <input type="checkbox"/> Resulted in prolongation of hospitalization <input type="checkbox"/> Resulted in permanent disability <input type="checkbox"/> None of the above	
9. Patient recovered <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNKNOWN				10. Date of vaccination mm / dd / yy AM/PM Time _____	
12. Relevant diagnostic tests/laboratory data					
13. Enter all vaccines given on date listed in no. 10					
Vaccine (type)		Manufacturer	Lot number	Route/Site	No. Previous doses
a. _____		_____	_____	_____	_____
b. _____		_____	_____	_____	_____
c. _____		_____	_____	_____	_____
d. _____		_____	_____	_____	_____
14. Any other vaccinations within 4 weeks prior to the date listed in no. 10					
Vaccine (type)		Manufacturer	Lot number	Route/Site	No. Previous doses
a. _____		_____	_____	_____	_____
b. _____		_____	_____	_____	_____
15. Vaccinated at: <input type="checkbox"/> Private doctor's office/hospital <input type="checkbox"/> Public health clinic/hospital		16. Vaccine purchased with: <input type="checkbox"/> Military clinic/hospital <input type="checkbox"/> Private funds <input type="checkbox"/> Public funds <input type="checkbox"/> Other/unknown		17. Other medications	
18. Illness at time of vaccination (specify)			19. Pre-existing physician-diagnosed allergies, birth defects, medical conditions (specify)		
20. Have you reported this adverse event previously? <input type="checkbox"/> No <input type="checkbox"/> To health department <input type="checkbox"/> To doctor <input type="checkbox"/> To manufacturer			Only for children 6 and under		
			22. Birth weight _____ lb. _____ oz.	23. No. of brothers and sisters	
21. Adverse event following prior vaccination (check all applicable, specify) Adverse Event Onset Age Type Vaccine Dose no. in series			Only for reports submitted by manufacturer/immunization project		
<input type="checkbox"/> In patient <input type="checkbox"/> In brother or sister			24. Mfr. / inm. proj. report no.	25. Date received by mfr. / inm. proj.	
			26. 15 day report? <input type="checkbox"/> Yes <input type="checkbox"/> No	27. Report type <input type="checkbox"/> Initial <input type="checkbox"/> Follow-Up	
Health care providers and manufacturers are required by law (42 USC 300aa-28) to report reactions to vaccines listed in the Table of Reportable Events Following Immunization. Reports for reactions to other vaccines are voluntary except when required as a condition of immunization grant awards.					

Day 9: February 9, 2015

SNOW DAY

- All offices on campus closed
- Classes cancelled
- Health Services open
- Statewide email from DOH
- Multiple television and radio inquiries to P.R.



STOP THE SWAP!

Day 10: February 10, 2015

- Email from VPSA to all students/parents/faculty/staff
- Email to all Study Abroad Students
- Email to all SCE
- Per diem staffing 24/7 began today

STOP THE SWAP!

Day 11: February 11, 2015

- Make up clinic in 64 Hall (Student Union)
 - 444 vaccinated
 - 20 vaccinated in Health Services
 - TOTAL=464
- Health Service's Staff schedule adjusted

STOP THE SWAP!

February 2015 Vaccination Clinics

- 3,061 vaccinated 2/8/15
- 444 vaccinated 2/11/15
- 20 vaccinated 2/11/15 in Health Services

TOTAL=3,525

TOTAL eligible was 3,745

TOTAL vaccinated 3,525

94 % of those eligible were vaccinated!!!

STOP THE SWAP!

Day 17-21: February 17-21, 2015

- CDC on campus
 - Carriage study
 - Total swabbed 717
 - Voluntary
 - Incentive
 - CDC in Health Services during evenings
- STOP THE SWAP!**

UPDATES

Day 21: February 21, 2015

- Health Services closes at 8:00am

Day 24: February 24, 2015

- Debriefing by Emergency Management Committee
- Planning meeting to be scheduled for April clinic

STOP THE SWAP!

One shot
provides only
minimal
protection.

The second dose of the
vaccine to protect against the
Group B strain of meningitis
will be offered on

Sunday April 12, 2015

from 9am-6pm in Peterson.
Anyone who received the first
vaccine is eligible.

It takes 6 months for the course
of vaccinations to take full
effect. A person can be a
carrier of meningitis without any
symptoms, so remember to

STOP the
SWAP

STOP
THE
SWAP



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Two months later....April 2015

Those eligible to receive vaccine #2:

- 2,855 students living on campus
 - 764 students living off campus
 - 141 commuter students
 - 76 graduate students < 25
 - 26 faculty/staff < 25
 - Less 121 study abroad
-
- TOTAL...3,741 eligible to receive the vaccine.

STOP THE SWAP!

April 2015 Men B #2 Vaccination Clinics

- 2,294 vaccinated 4/12/15
- 694 vaccinated 4/15/15

TOTAL eligible.... 3,741

TOTAL vaccinated.... 2,988

80% of those eligible were vaccinated

STOP THE SWAP!



STOP THE SWAP

Your risk for meningococcal meningitis increases if you are exposed to the bacteria that causes it. Sharing things like lip balm, kisses, common source punch bowls, food, eating utensils, water bottles, cups, cigarettes, or any other type of saliva transference can spread the meningococcal disease. A person can be a carrier of meningitis without any symptoms, so remember to

STOP the
SWAP.

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April 10-15, 2015....CDC on campus

CDC at Men B vaccination clinics

- April 12, 2015 carriage study
- April 15, 2015 carriage study
 - Total swabbed 878
- Voluntary
- Incentive

STOP THE SWAP!

May 6-11, 2015

Health Services hours of operation extended

- Daily hours of operation extended through 8:00pm
- 5:00pm-8:00pm- Men B vaccinations offered

STOP THE SWAP!

STUDY ABROAD VACCINATIONS

- August 11,2015
 - 15 vaccinated
- August 17, 2015
 - 16 vaccinated
- August 24-28, 2015
 - 27 vaccinated
- TOTAL vaccinated= 58

STOP THE SWAP!

AUGUST 2015

- DOH and CDC recommend vaccinating incoming freshmen
- Email Class of 2019
- Email Class of 2019 parents
- Clinic preparations
- Forms revised
 - “Have you ever received a vaccine for Serogroup B meningitis”

STOP THE SWAP!

Men B vaccination clinic #1 for class of 2019

TOTAL number eligible to be vaccinated....1,034

- August 30, 2015 Men B Clinic.... 717 vaccinated
- September 5, 2015 Men B clinic.... 136 vaccinated
- September 8, 2015 make up clinic.... 40 vaccinated

TOTAL vaccinated.... 893

86% of those eligible were vaccinated!!!

STOP THE SWAP!

Men B vaccination clinic #3 for Upperclassmen

September 5, 2015:

- 1655 vaccinated

September 8, 2015:

- 643 vaccinated

Health Services:

- 83 vaccinated

TOTAL=2381

STOP THE SWAP!

September 5, 2015

- CDC at Men B vaccination clinic
- September 5, 2015 Carriage Study
 - Total swabbed 617
- Voluntary
- Incentive

STOP THE SWAP!

Self-Assessment Screening Questions For Meningococcal B Vaccination

<p>Have you ever received a vaccine for serogroup B meningitis?</p> <p align="right">If YES, which of the following:</p> <p align="right">Trumenba: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know</p> <p align="right">Bexsero: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know</p>
<p>Are you older than 25 years old?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know</p>
<p>Are you sick today?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know</p>
<p>Do you have allergies to any of the following? If yes, please describe.</p> <p>Medications: _____</p> <p>Food: _____</p> <p>A vaccine component _____</p> <p>Latex (rubber material that is found in gloves or other products) _____</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know</p>
<p>Have you ever had a serious reaction after receiving a vaccine?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know</p>
<p>Do you have any long term health problems (for example asthma, diabetes, seizure disorder)?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know</p>
<p>Do you have cancer, leukemia, HIV/AIDS, a non-functioning or absent spleen, or any other immune system problem?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know</p>
<p>In the past 3 months, have you taken medications that weaken your immune system, such as cortisone, prednisone, other steroids, or anticancer drugs? Or have you had radiation treatments?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know</p>
<p>For women:</p> <p>Are you pregnant, think you could be pregnant or planning to become pregnant?</p> <p>Are you breastfeeding?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know</p>
<p>Form Completed By: _____ Date: _____</p>	
<p>Form Reviewed By: _____ Date: _____</p>	

All **sophomore, junior, and senior** students who have received at least one dose of the serogroup B vaccine on campus have received the TRUMENBA vaccine. Please answer question #1 as follows:

Self-Assessment Screening Questions For Meningococcal B Vaccination	
Have you ever received a vaccine for <u>serogroup B meningitis</u> ?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know
If YES, which of the following:	
<u>Trumenba</u> :	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know
<u>Bexsero</u> :	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Don't Know

If you are a **FRESHMAN, TRANSFER STUDENT, returning STUDY ABROAD,** or this is your **FIRST serogroup B vaccination,** you must be able to answer the above questions prior to getting in line to receive the vaccine. It is your responsibility to contact your family and or PCP with questions.

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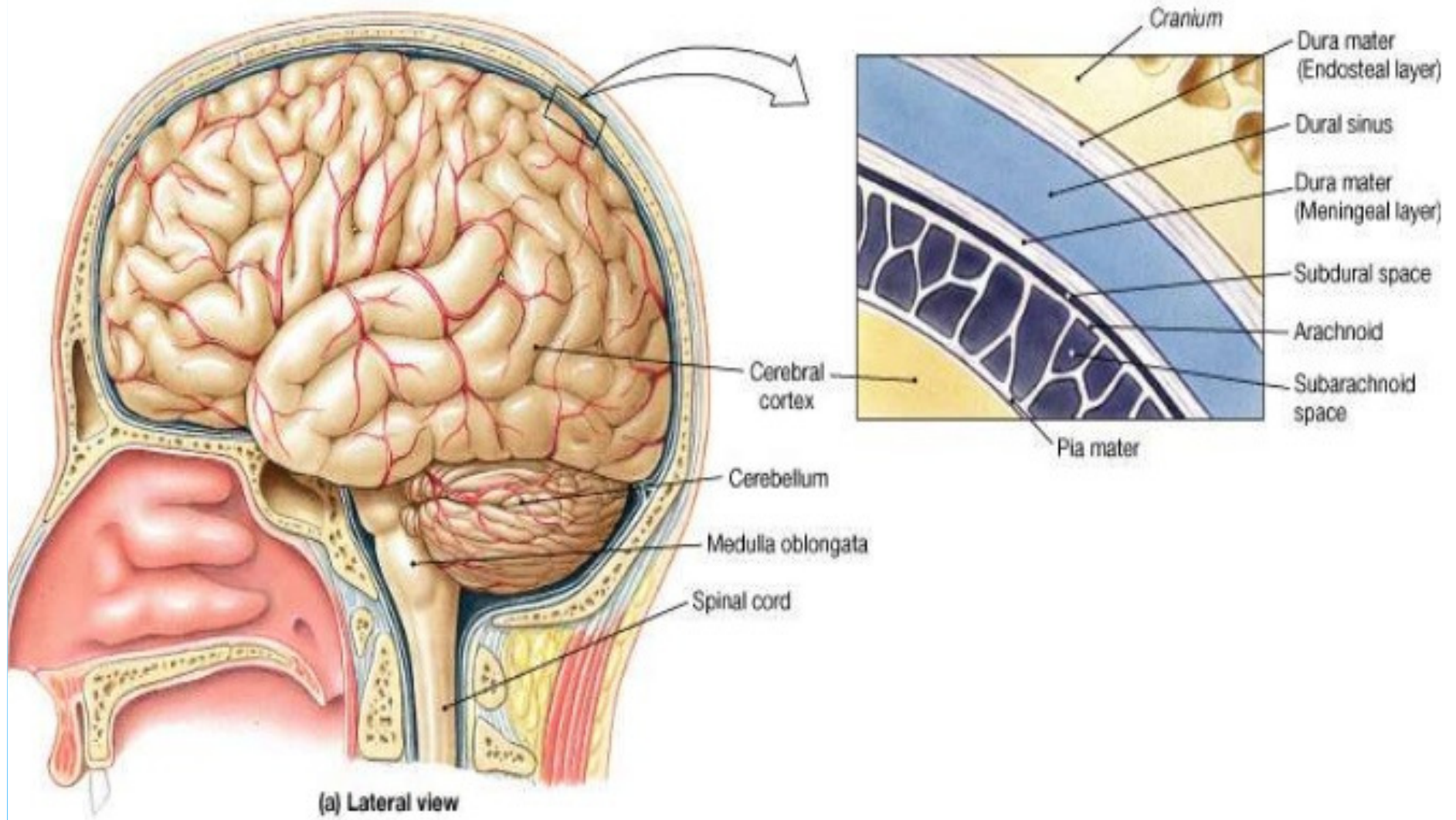
One shot
provides only
minimal
protection.

It takes 6 months for the course of vaccinations to take full effect. A person can be a carrier of meningitis without any symptoms, so remember to

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Don't share:
Lip balms
Water bottles
Dishes/eating utensils
Cups/glasses
Etc.

The Meninges



Bacterial meningitis

Bacterial first recognized in 1805

1805 to early 1900's bacterial meningitis
>70% fatal

Case-fatality rate for adults 25%

Transient or permanent neurological morbidity 21-28%

Bacterial meningitis

Community acquired - Streptococcus pneumoniae, Neisseria meningitidis

Age > 60 - Listeria monocytogenes

Healthcare associated - staphylococci, aerobic gram negative bacilli

Neisseria meningitidis

12 different meningococcal groups

5 of which cause the majority of disease (A, B, C, Y, and W).



Permission from Foreveremily.org



Rate of Meningitis 1970-2010 Cases/100,000

Outbreaks of Serogroup B 2013-2015

- University of California, Santa Barbara: Four cases in 2013.
- Princeton University: Nine cases from March 2013 through March 2014.
 - * One Drexel University student who was in contact with Princeton students died.
- University of Oregon: Seven cases from January to June 2015. ◦ One student died.
- Providence College: Two cases within a week at Providence College in early February 2015.

Predisposing Factors Bacterial Meningitis

- Recent exposure to someone with meningococcal meningitis
- Recent infection (especially respiratory or otic infection)
- Recent travel to areas with endemic meningococcal disease, such as sub-Saharan Africa
- Penetrating head trauma
- Cerebrospinal fluid (CSF) otorrhea or CSF rhinorrhea
- Cochlear implant devices
- Anatomic defects (recent neurosurgical procedure, ventricular shunt placement)

Clinical Features of Bacterial Meningitis

Two patterns of presentation:

Meningitis develops progressively over one or several days and can be preceded by febrile illness

Meningitis course is acute and fulminant:
Sepsis and meningitis develop rapidly over several hours

Clinical Features of Bacterial Meningitis

Classic triad: fever, nuchal rigidity, mental status change

Headache is common and not easily confused with a normal headache

Triad more common with strep pneumoniae than neisseria

Neisseria meningitidis has characteristic skin manifestation

Examination for nuchal rigidity

Inability to place chin on chest

Brudzinski sign- spontaneous flexion of hips with passive flexion of neck.

Kernig sign-inability or reluctance to allow full knee extension when hip is flexed 90 degrees.





Atypical Presentation

Most dramatic predictor of death is **absence of fever** at presentation

Lack of headache

Lack of neck stiffness

Look for leg pain, cold hands/feet, abnormal skin color (pallor/mottling)

Systemic complications

Septic shock

Disseminated intravascular
coagulation

Myocardial involvement

Purpura fulminans



With permission from Meningitis Now



With permission from Meningitis Now





With permission from Dorset Orthopaedic Co Ltd

Neurologic Complications

- Impaired mental status
- Increased intracranial pressure and cerebral edema
- Seizures
- Focal neurologic deficits (eg, cranial nerve palsy, hemiparesis)
- Sensorineural hearing loss
- Cognitive impairment

Case #1 Presentation 2/1/15

Signs and symptoms:

- 1 week coryza like illness
- Headache for 12 hours prior to hospital admission
- Restlessness and severe headache on morning of hospitalization

Bacterial meningitis is... a medical **EMERGENCY**

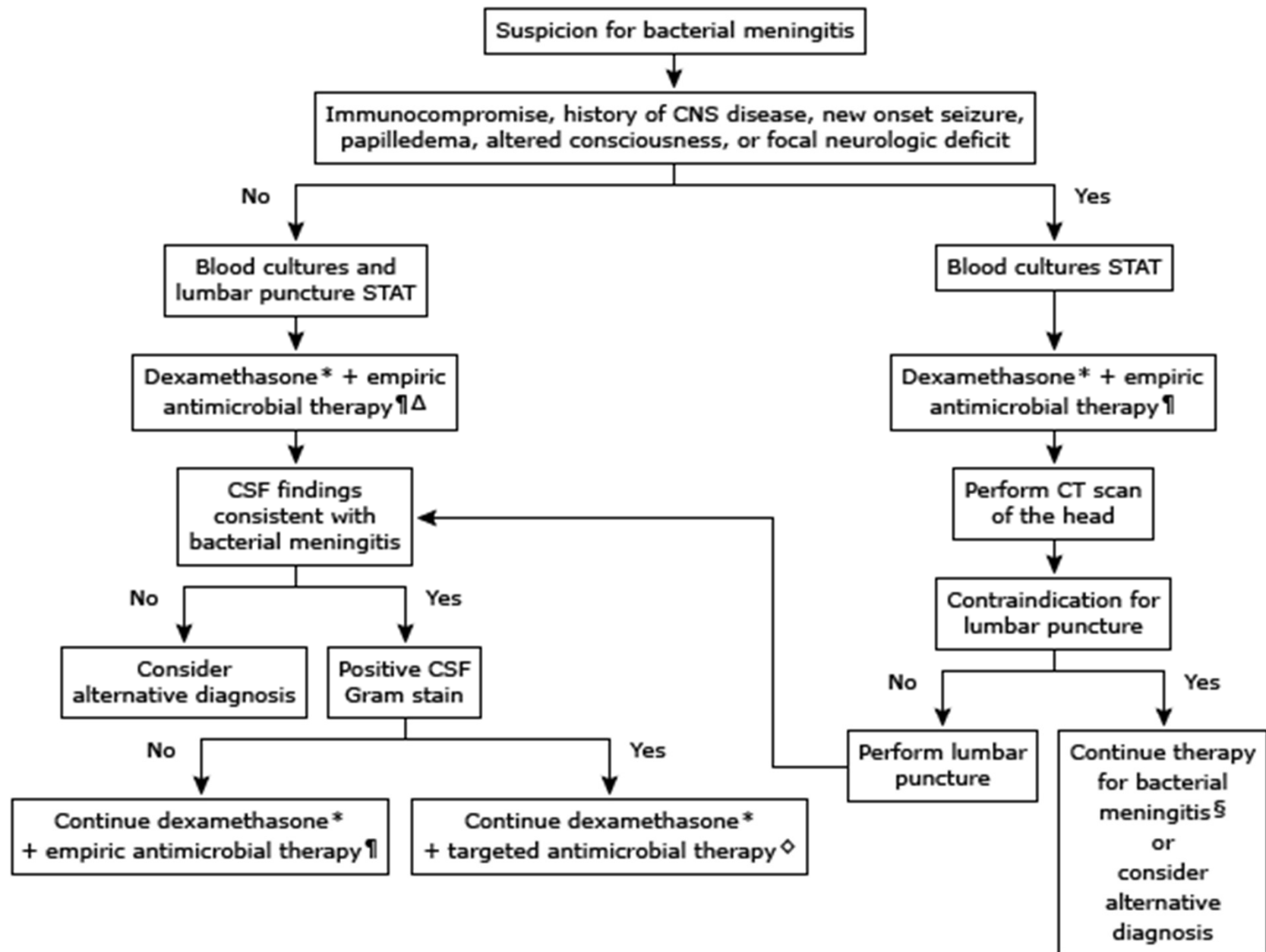
Immediate steps must be taken to establish specific cause and initiate effective therapy

Avoidance of delay of antimicrobial therapy is critical

Most common causes of delay are atypical presentation and delay due to imaging

Effects of delay include increase in adverse outcomes and mortality

Management algorithm for adults with suspected bacterial meningitis



Where does meningococcal meningitis come from?

Lives naturally at the back of the nose and throat.

Human beings are the only site where meningococcal bacteria can live.

One in ten people carry the bacteria

Most of us have **natural resistance**.

Fragile -cannot survive for more than a few moments outside the human body.

Carriage

Five to ten percent of adults are asymptomatic nasopharyngeal carriers.

Adolescents and young adults have the highest rates of meningococcal carriage.

Few carriers develop invasive disease.

Transmission of Illness

- Nasopharyngeal carriage plays an important role in transmission
- Spontaneous loss and acquisition of carriage is common.
- Recurrent colonization may occur after prophylaxis.
- Antimicrobial prophylaxis has no proven clinical efficacy outside of an outbreak.

Methods for Prevention

Antimicrobial chemoprophylaxis following identification of an index case

Use of droplet precautions for 24 hours after institution of effective antibiotics in patients with suspected or confirmed *Neisseria meningitidis* infection

Vaccination prior to exposure

Avoidance of risk factors

Recommended chemoprophylaxis regimens for protection against meningococcal disease – Advisory Committee on Immunization Practices (ACIP), United States, 2012

Drug	Age group	Dose	Duration and route of administration*
Rifampin [¶]	Children aged <1 month	5 mg/kg every 12 hours	Two days
	Children aged ≥1 month	10 mg/kg every 12 hours	Two days
	Adults	600 mg every 12 hours	Two days
Ciprofloxacin ^Δ	Adults	500 mg	Single dose
Ceftriaxone	Children age <15 years	125 mg	Single IM dose
Ceftriaxone	Adults	250 mg	Single IM dose

Risk Factors

- Adolescents and young adults
- Infants less than one year old
- Persistent complement component deficiency or anatomic/functional asplenia
- People living in crowded settings like college dorms or military barracks
- People traveling to certain areas outside the U.S. such as the meningitis belt in Africa
- Laboratory personnel who are routinely exposed to meningococcal bacteria
- Those who might have been exposed to meningococcal disease during an outbreak

Which meningococcal vaccines are available?

In the U.S.:

Meningococcal conjugate vaccine (MCV4),
(Menactra, MenHibrix, and Menveo).

Meningococcal polysaccharide vaccine (MPSV4),
(Menomune).

Serogroup B meningococcal vaccine (Trumenba
and Bexsero).

CDC Recommendation for A,C,W,Y Meningococcal Vaccine?

All children ages 11-18 or certain younger high-risk children

First-year college students living on campus

Anyone exposed to meningitis during an outbreak

Anyone traveling to or living where meningitis is common, such as in sub-Saharan Africa/Military recruits

People with immune disorders/asplenia

CDC Recommendations for Serogroup B Vaccine?

In June 2015: the CDC's Advisory Committee on Immunization Practices (ACIP)

Permissive use of meningococcal serogroup B vaccine:

- ages 16-23,
- preferred age 16-18,
- high risk persons and during outbreaks.

MMWR, 10/22/15: the ACIP recommendations for the Use of Serogroup B Meningococcal Vaccines in Adolescents and Young Adults were published

Summary of ACIP MMWR 10/23/15

MenB vaccines **might** be an important step for controlling serogroup B meningococcal disease.

Protect against the majority of currently circulating strains.

Not expected to provide protection against disease caused by all serogroup B strains circulating in US.

Additional studies assessing breadth of strain coverage are ongoing.

Immune responses following MenB vaccination were studied.

No data are available on vaccine effectiveness against clinical disease endpoints or duration of protection.

No concerning patterns of serious adverse events have been reported for MenB vaccines.

Summary of ACIP MMWR 10/22/15

Additional safety data and postlicensure safety surveillance data are needed.

ACIP “ a preference to administer the MenB series in later adolescence exists, preferably at age 16-18 years, to maximize the likelihood that protection would last into the highest age-related risk period.”

“insufficient evidence exists to make a routine public health recommendation that all adolescents be vaccinated with MenB vaccine.”

ACIP Recommendations 10/22/2015 MMWR

A MenB vaccine series may be administered to adolescents and young adults aged 16-23 years to provide short-term protection against most strains of serogroup B meningococcal disease. The preferred age for MenB vaccination is 16-18 years (recommendation Category B).

The two MenB vaccines are not interchangeable; the same vaccine product must be used for all doses.

MenB-FHbp or MenB-4C may be administered concomitantly with other vaccines indicated for this age, but at a different anatomic site, if feasible.

Additional information for health care providers and parents can be found on the CDC website at

<http://www.cdc.gov/meningococcal>.