

HIGHLIGHTS OF PRESCRIBING INFORMATION

These highlights do not include all the information needed to use Menactra® safely and effectively. See full prescribing information for Menactra vaccine.

Menactra®, Meningococcal (Groups A, C, Y and W-135) Polysaccharide Diphtheria Toxoid Conjugate Vaccine
Solution for Intramuscular Injection

Initial U.S. Approval: 2005

RECENT MAJOR CHANGES

Warnings and Precautions, Altered Immunocompetence (5.3) 4/2018

INDICATIONS AND USAGE

Menactra is indicated for active immunization to prevent invasive meningococcal disease caused by *Neisseria meningitidis* serogroups A, C, Y and W-135. Menactra is approved for use in individuals 9 months through 55 years of age. Menactra does not prevent *N meningitidis* serogroup B disease. (1)

DOSAGE AND ADMINISTRATION

A 0.5 mL dose for intramuscular injection. (2)

Primary Vaccination:

- Children 9 through 23 months of age: Two doses, three months apart.
- Individuals 2 through 55 years of age: A single dose.

Booster Vaccination:

- A single booster dose may be given to individuals 15 through 55 years of age at continued risk for meningococcal disease, if at least 4 years have elapsed since the prior dose.

DOSAGE FORMS AND STRENGTHS

Solution supplied in 0.5 mL single-dose vials (3)

CONTRAINDICATIONS

- Severe allergic reaction (eg, anaphylaxis) after a previous dose of a meningococcal capsular polysaccharide-, diphtheria toxoid- or CRM₁₉₇-containing vaccine, or to any component of Menactra. (4)

WARNINGS AND PRECAUTIONS

- Persons previously diagnosed with Guillain-Barré syndrome (GBS) may be at increased risk of GBS following receipt of Menactra. The decision to give Menactra should take into account the potential benefits and risks. (5.1)

ADVERSE REACTIONS

- Common (≥10%) solicited adverse events in infants and toddlers 9 and 12 months of age were injection site tenderness, erythema, and swelling; irritability, abnormal crying, drowsiness, appetite loss, vomiting, and fever. (6)
- Common (≥10%) solicited adverse events in individuals 2 through 55 years of age who received a single dose were injection site pain, redness, induration, and swelling; anorexia and diarrhea. Other common solicited adverse events were irritability and drowsiness (2-10 years of age), headache, fatigue, malaise, and arthralgia (11-55 years of age). (6)

To report SUSPECTED ADVERSE REACTIONS, contact Sanofi Pasteur Inc. at 1-800-822-2463 (1-800-VACCINE) or VAERS at 1-800-822-7967 or <http://vaers.hhs.gov>.

DRUG INTERACTIONS

- When Menactra and DAPTACEL® (Diphtheria and Tetanus Toxoids and Acellular Pertussis Vaccine Adsorbed) are to be administered to children 4 through 6 years of age, preference should be given to simultaneous administration of the 2 vaccines or administration of Menactra prior to DAPTACEL. Administration of Menactra one month after DAPTACEL has been shown to reduce meningococcal antibody responses to Menactra. (7.1)
- Pneumococcal antibody responses to some serotypes in Prevnar (PCV7) were decreased following co-administration of Menactra and PCV7. (7.1)

USE IN SPECIFIC POPULATIONS

- Safety and effectiveness of Menactra have not been established in children younger than 9 months of age, pregnant women, nursing mothers, and adults older than 55 years of age. (8.1, 8.2, 8.4, 8.5)
- A pregnancy registry is available. Contact Sanofi Pasteur Inc. at 1-800-822-2463. (8.1)

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Revised: April 2018

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1 **FULL PRESCRIBING INFORMATION:**

2 **1 INDICATIONS AND USAGE**

3 Menactra®, Meningococcal (Groups A, C, Y and W-135) Polysaccharide Diphtheria Toxoid
4 Conjugate Vaccine, is indicated for active immunization to prevent invasive meningococcal
5 disease caused by *Neisseria meningitidis* serogroups A, C, Y and W-135. Menactra is approved
6 for use in individuals 9 months through 55 years of age. Menactra does not prevent *N meningitidis*
7 serogroup B disease.

8

9 **2 DOSAGE AND ADMINISTRATION**

10 **2.1 Preparation for Administration**

11 Menactra is a clear to slightly turbid solution. Parenteral drug products should be inspected
12 visually for particulate matter and discoloration prior to administration, whenever solution and
13 container permit. If any of these conditions exist, the vaccine should not be administered.

14

15 Withdraw the 0.5 mL dose of vaccine from the single-dose vial using a sterile needle and syringe.

16

17 **2.2 Dose and Schedule**

18 Menactra is administered as a 0.5 mL dose by intramuscular injection. Do not administer this
19 product intravenously or subcutaneously.

20

21 ***Primary Vaccination:***

- 22 • In children 9 through 23 months of age, Menactra is given as a 2-dose series three months
23 apart.

- 1 • Individuals 2 through 55 years of age, Menactra is given as a single dose.

2

3 ***Booster Vaccination:***

- 4 • A single booster dose may be given to individuals 15 through 55 years of age at continued risk
5 for meningococcal disease, if at least 4 years have elapsed since the prior dose.

6

7 **3 DOSAGE FORMS AND STRENGTHS**

8 Menactra is a solution supplied in 0.5 mL single-dose vials. [See *Description (11)* for a complete
9 listing of ingredients.]

10

11 **4 CONTRAINDICATIONS**

12 Severe allergic reaction (eg, anaphylaxis) after a previous dose of a meningococcal capsular
13 polysaccharide-, diphtheria toxoid- or CRM₁₉₇-containing vaccine, or to any component of
14 Menactra [see *Description (11)*].

15

16 **5 WARNINGS AND PRECAUTIONS**

17 **5.1 Guillain-Barré Syndrome**

18 Persons previously diagnosed with Guillain-Barré syndrome (GBS) may be at increased risk of
19 GBS following receipt of Menactra. The decision to give Menactra should take into account the
20 potential benefits and risks.

21

1 GBS has been reported in temporal relationship following administration of Menactra (1) (2). The
2 risk of GBS following Menactra vaccination was evaluated in a post-marketing retrospective
3 cohort study [see *Post-Marketing Experience* (6.2)].
4

5 **5.2 Preventing and Managing Allergic Vaccine Reactions**

6 Prior to administration, the healthcare provider should review the immunization history for
7 possible vaccine sensitivity and previous vaccination-related adverse reactions to allow an
8 assessment of benefits and risks. Epinephrine and other appropriate agents used for the control of
9 immediate allergic reactions must be immediately available should an acute anaphylactic reaction
10 occur.
11

12 **5.3 Altered Immunocompetence**

13 • *Reduced Immune Response*

14 Some individuals with altered immunocompetence, including some individuals receiving
15 immunosuppressant therapy, may have reduced immune responses to Menactra.
16

17 • *Complement Deficiency*

18 Persons with certain complement deficiencies and persons receiving treatment that inhibits
19 terminal complement activation (for example, eculizumab) are at increased risk for invasive
20 disease caused by *N meningitidis*, including invasive disease caused by serogroups A, C, Y and
21 W-135, even if they develop antibodies following vaccination with Menactra. [See *Clinical*
22 *Pharmacology* (12).]

1

2 **5.4 Limitations of Vaccine Effectiveness**

3 Menactra may not protect all recipients.

4

5 **5.5 Syncope**

6 Syncope (fainting) has been reported following vaccination with Menactra. Procedures should be
7 in place to prevent falling injury and manage syncopal reactions.

8

9 **6 ADVERSE REACTIONS**

10 **6.1 Clinical Trials Experience**

11 Because clinical trials are conducted under widely varying conditions, adverse reaction rates
12 observed in the clinical trials of a vaccine cannot be directly compared to rates in the clinical trials
13 of another vaccine and may not reflect the rates observed in practice.

14

15 *Children 9 Through 12 Months of Age*

16 The safety of Menactra was evaluated in four clinical studies that enrolled 3721 participants who
17 received Menactra at 9 and 12 months of age. At 12 months of age these children also received
18 one or more other recommended vaccines [Measles, Mumps, Rubella and Varicella Virus Vaccine
19 Live (MMRV) or Measles, Mumps, and Rubella Virus Vaccine (MMR) and Varicella Virus
20 Vaccine Live (V) each manufactured by Merck & Co., Inc., Pneumococcal 7-valent Conjugate
21 Vaccine (Diphtheria CRM₁₉₇ Protein) manufactured by Wyeth Pharmaceuticals Inc. (PCV7),
22 Hepatitis A Vaccine manufactured by Merck & Co., Inc. (HepA). A control group of 997 children

1 was enrolled at 12 months of age and received two or more childhood vaccines [MMRV (or
2 MMR+V), PCV7, HepA] at 12 months of age [see *Concomitant Vaccine Administration (14.3)*].
3 Three percent of individuals received MMR and V, instead of MMRV, at 12 months of age.

4
5 The primary safety study was a controlled trial that enrolled 1256 children who received Menactra
6 at 9 and 12 months of age. At 12 months of age these children received MMRV (or MMR+V),
7 PCV7 and HepA. A control group of 522 children received MMRV, PCV7 and HepA. Of the
8 1778 children, 78% of participants (Menactra, N=1056; control group, N=322) were enrolled at
9 United States (US) sites and 22% at a Chilean site. (Menactra, N=200; control group, N=200).

11 *Individuals 2 Through 55 Years of Age*

12 The safety of Menactra was evaluated in eight clinical studies that enrolled 10,057 participants
13 aged 2-55 years who received Menactra and 5,266 participants who received Menomune® –
14 A/C/Y/W-135, Meningococcal Polysaccharide Vaccine, Groups A, C, Y and W-135 Combined.
15 There were no substantive differences in demographic characteristics between the vaccine groups.
16 Among Menactra recipients 2-55 years of age 24.0%, 16.2%, 40.4% and 19.4% were in the 2-10,
17 11-14, 15-25 and 26-55-year age groups, respectively. Among Menomune – A/C/Y/W-135
18 recipients 2-55 years of age 42.3%, 9.3%, 30.0% and 18.5% were in the 2-10, 11-14, 15-25 and
19 26-55-year age groups, respectively. The three primary safety studies were randomized, active-
20 controlled trials that enrolled participants 2-10 years of age (Menactra, N=1713; Menomune –
21 A/C/Y/W-135, N=1519), 11-18 years of age (Menactra, N=2270; Menomune – A/C/Y/W-135,
22 N=972) and 18-55 years of age (Menactra, N=1384; Menomune – A/C/Y/W-135, N=1170),
23 respectively. Of the 3232 children 2-10 years of age, 68% of participants (Menactra, N=1164;

1 Menomune – A/C/Y/W-135, N=1031) were enrolled at US sites and 32% (Menactra, N=549;
2 Menomune – A/C/Y/W-135, N=488) of participants at a Chilean site. The median ages in the
3 Chilean and US subpopulations were 5 and 6 years, respectively. All adolescents and adults were
4 enrolled at US sites. As the route of administration differed for the two vaccines (Menactra given
5 intramuscularly, Menomune – A/C/Y/W-135 given subcutaneously), study personnel collecting
6 the safety data differed from personnel administering the vaccine.

7

8 ***Booster Vaccination Study***

9 In an open-label trial conducted in the US, 834 individuals were enrolled to receive a single dose
10 of Menactra 4-6 years after a prior dose. The median age of participants was 17.1 years at the time
11 of the booster dose.

12

13 ***Safety Evaluation***

14 Participants were monitored after each vaccination for 20 or 30 minutes for immediate reactions,
15 depending on the study. Solicited injection site and systemic reactions were recorded in a diary
16 card for 7 consecutive days after each vaccination. Participants were monitored for 28 days (30
17 days for infants and toddlers) for unsolicited adverse events and for 6 months post-vaccination for
18 visits to an emergency room, unexpected visits to an office physician, and serious adverse events.

19 Unsolicited adverse event information was obtained either by telephone interview or at an interim
20 clinic visit. Information regarding adverse events that occurred in the 6-month post-vaccination
21 time period was obtained via a scripted telephone interview.

22

1 ***Serious Adverse Events in All Safety Studies***

2 Serious adverse events (SAEs) were reported during a 6-month time period following
3 vaccinations in individuals 9 months through 55 years of age. In children who received Menactra
4 at 9 months and at 12 months of age, SAEs occurred at a rate of 2.0% - 2.5%. In participants who
5 received one or more childhood vaccine(s) (without co-administration of Menactra) at 12 months
6 of age, SAEs occurred at a rate of 1.6% - 3.6%, depending on the number and type of vaccines
7 received. In children 2-10 years of age, SAEs occurred at a rate of 0.6% following Menactra and
8 at a rate of 0.7% following Menomune – A/C/Y/W-135. In adolescents 11 through 18 years of age
9 and adults 18 years through 55 years of age, SAEs occurred at a rate of 1.0% following Menactra
10 and at a rate of 1.3% following Menomune – A/C/Y/W-135. In adolescents and adults, SAEs
11 occurred at a rate of 1.3% following booster vaccination with Menactra.

12
13 ***Solicited Adverse Events in the Primary Safety Studies***

14 The most frequently reported solicited injection site and systemic adverse reactions within 7 days
15 following vaccination in children 9 months and 12 months of age (Table 1) were injection site
16 tenderness and irritability.

17
18 The most frequently reported solicited injection site and systemic adverse reactions in US children
19 aged 2-10 years of age (Table 2) were injection site pain and irritability. Diarrhea, drowsiness,
20 and anorexia were also common.

21
22 The most commonly reported solicited injection site and systemic adverse reactions in
23 adolescents, ages 11-18 years (Table 3), and adults, ages 18-55 years (Table 4), after a single dose

1 were injection site pain, headache and fatigue. Except for redness in adults, injection site reactions
2 were more frequently reported after Menactra vaccination than after Menomune – A/C/Y/W-135
3 vaccination.
4

1 **Table 1: Percentage of US Participants Reporting Solicited Adverse Reactions Within 7**
2 **Days Following Vaccine Administration at 9 Months and 12 Months of Age**

Reaction	Menactra at 9 months of age N ^d =998 - 1002			Menactra + PCV7 ^a + MMRV ^b + HepA ^c at 12 months of age N ^d =898 - 908			PCV7 ^a + MMRV ^b + HepA ^c at 12 months of age N ^d =302 - 307		
	Any	Grade 2	Grade 3	Any	Grade 2	Grade 3	Any	Grade 2	Grade 3
Local/Injection Site									
Tenderness^e									
Menactra Site	37.4	4.3	0.6	48.5	7.5	1.3	-	-	-
PCV7 Site	-	-	-	45.6	9.4	1.6	45.7	8.3	0.3
MMRV Site	-	-	-	38.9	7.1	1.0	43.0	5.2	0.0
HepA Site	-	-	-	43.4	8.7	1.4	40.9	4.6	0.3
Erythema^f									
Menactra Site	30.2	2.5	0.3	30.1	1.3	0.1	-	-	-
PCV7 Site	-	-	-	29.4	2.6	0.2	32.6	3.0	0.7
MMRV Site	-	-	-	22.5	0.9	0.3	33.2	5.9	0.0
HepA Site	-	-	-	25.1	1.1	0.0	26.6	0.7	0.0
Swelling^f									
Menactra Site	16.8	0.9	0.2	16.2	0.9	0.1	-	-	-
PCV7 Site	-	-	-	19.5	1.3	0.4	16.6	1.3	0.7
MMRV Site	-	-	-	12.1	0.4	0.1	14.1	0.3	0.0
HepA Site	-	-	-	16.4	0.7	0.2	13.5	0.0	0.3
Systemic									
Irritability ^g	56.8	23.1	2.9	62.1	25.7	3.7	64.8	28.7	4.2
Abnormal crying ^h	33.3	8.3	2.0	40.0	11.5	2.4	39.4	10.1	0.7
Drowsiness ⁱ	30.2	3.5	0.7	39.8	5.3	1.1	39.1	5.2	0.7
Appetite loss ^j	30.2	7.1	1.2	35.7	7.6	2.6	31.9	6.5	0.7
Vomiting ^k	14.1	4.6	0.3	11.0	4.4	0.2	9.8	2.0	0.0
Fever ^l	12.2	4.5	1.1	24.5	11.9	2.2	21.8	7.3	2.6

3 ^aPCV7 (Prevnar®) = Pneumococcal 7-valent Conjugate Vaccine

4 ^bMMRV (ProQuad®) = Measles, Mumps, Rubella and Varicella Virus Vaccine Live

- 1 ^c HepA (VAQTA®) = Hepatitis A Vaccine, Inactivated
- 2 ^d N = The number of participants with available data.
- 3 ^e Grade 2: cries and protests when injection site is touched, Grade 3: cries when injected limb is moved, or the
- 4 movement of the injected limb is reduced.
- 5 ^f Grade 2: ≥ 1.0 inches to < 2.0 inches, Grade 3: ≥ 2.0 inches.
- 6 ^g Grade 2: requires increased attention, Grade 3: inconsolable.
- 7 ^h Grade 2: 1 to 3 hours, Grade 3: > 3 hours.
- 8 ⁱ Grade 2: not interested in surroundings or did not wake up for a feed/meal, Grade 3: sleeping most of the time or
- 9 difficult to wake up.
- 10 ^j Grade 2: missed 1 or 2 feeds/meals completely, Grade 3: refuses ≥ 3 feeds/meals or refuses most feeds/meals.
- 11 ^k Grade 2: 2 to 5 episodes per 24 hours, Grade 3: ≥ 6 episodes per 24 hours or requiring parenteral hydration.
- 12 ^l Grade 2: $> 38.5^{\circ}\text{C}$ to $\leq 39.5^{\circ}\text{C}$, Grade 3: $> 39.5^{\circ}\text{C}$.
- 13
- 14

1 **Table 2: Percentage of US Participants 2 Years Through 10 Years of Age Reporting**
2 **Solicited Adverse Reactions Within 7 Days Following Vaccine Administration**

Reaction	Menactra			Menomune – A/C/Y/W-135		
	N ^a =1156 - 1157			N ^a =1027		
	Any	Grade 2	Grade 3	Any	Grade 2	Grade 3
Local/Injection Site						
Pain ^b	45.0	4.9	0.3	26.1	2.5	0.0
Redness ^c	21.8	4.6	3.9	7.9	0.5	0.0
Induration ^c	18.9	3.4	1.4	4.2	0.6	0.0
Swelling ^c	17.4	3.9	1.9	2.8	0.3	0.0
Systemic						
Irritability ^d	12.4	3.0	0.3	12.2	2.6	0.6
Diarrhea ^e	11.1	2.1	0.2	11.8	2.5	0.3
Drowsiness ^f	10.8	2.7	0.3	11.2	2.5	0.5
Anorexia ^g	8.2	1.7	0.4	8.7	1.3	0.8
Arthralgia ^h	6.8	0.5	0.2	5.3	0.7	0.0
Fever ⁱ	5.2	1.7	0.3	5.2	1.7	0.2
Rash ^j	3.4	-	-	3.0	-	-
Vomiting ^k	3.0	0.7	0.3	2.7	0.7	0.6
Seizure ^j	0.0	-	-	0.0	-	-

3 ^a N = The total number of participants reporting at least one solicited reaction. The median age of participants was 6
4 years in both vaccine groups.

5 ^b Grade 2: interferes with normal activities, Grade 3: disabling, unwilling to move arm.

6 ^c Grade 2: 1.0-2.0 inches, Grade 3: >2.0 inches.

7 ^d Grade 2: 1-3 hours duration, Grade 3: >3 hours duration.

8 ^e Grade 2: 3-4 episodes, Grade 3: ≥5 episodes.

9 ^f Grade 2: interferes with normal activities, Grade 3: disabling, unwilling to engage in play or interact with others.

10 ^g Grade 2: skipped 2 meals, Grade 3: skipped ≥3 meals.

1 ^hGrade 2: decreased range of motion due to pain or discomfort, Grade 3: unable to move major joints due to pain.

2 ⁱOral equivalent temperature; Grade 2: 38.4°C to 39.4°C, Grade 3: $\geq 39.5^\circ\text{C}$.

3 ^jThese solicited adverse events were reported as present or absent only.

4 ^kGrade 2: 2 episodes, Grade 3: ≥ 3 episodes.

5 Note: During the study Grade 1, Grade 2, and Grade 3 were collected as Mild, Moderate, and Severe respectively.

6

7

1 **Table 3: Percentage of Participants 11 Years Through 18 Years of Age Reporting Solicited**
2 **Adverse Reactions Within 7 Days Following Vaccine Administration With a Single Dose**

Reaction	Menactra N ^a =2264 - 2265			Menomune – A/C/Y/W-135 N ^a =970		
	Any	Grade 2	Grade 3	Any	Grade 2	Grade 3
Local/Injection Site						
Pain ^b	59.2 ^c	12.8 ^c	0.3	28.7	2.6	0.0
Induration ^d	15.7 ^c	2.5 ^c	0.3	5.2	0.5	0.0
Redness ^d	10.9 ^c	1.6 ^c	0.6 ^c	5.7	0.4	0.0
Swelling ^d	10.8 ^c	1.9 ^c	0.5 ^c	3.6	0.3	0.0
Systemic						
Headache ^e	35.6 ^c	9.6 ^c	1.1	29.3	6.5	0.4
Fatigue ^e	30.0 ^c	7.5	1.1 ^c	25.1	6.2	0.2
Malaise ^e	21.9 ^c	5.8 ^c	1.1	16.8	3.4	0.4
Arthralgia ^e	17.4 ^c	3.6 ^c	0.4	10.2	2.1	0.1
Diarrhea ^f	12.0	1.6	0.3	10.2	1.3	0.0
Anorexia ^g	10.7 ^c	2.0	0.3	7.7	1.1	0.2
Chills ^e	7.0 ^c	1.7 ^c	0.2	3.5	0.4	0.1
Fever ^h	5.1 ^c	0.6	0.0	3.0	0.3	0.1
Vomiting ⁱ	1.9	0.4	0.3	1.4	0.5	0.3
Rash ^j	1.6	-	-	1.4	-	-
Seizure ^j	0.0	-	-	0.0	-	-

3 ^aN = The number of participants with available data.

4 ^bGrade 2: interferes with or limits usual arm movement, Grade 3: disabling, unable to move arm.

5 ^cDenotes $p < 0.05$ level of significance. The p -values were calculated for each category and severity using Chi Square
6 test.

7 ^dGrade 2: 1.0-2.0 inches, Grade 3: >2.0 inches.

8 ^eGrade 2: interferes with normal activities, Grade 3: requiring bed rest.

9 ^fGrade 2: 3-4 episodes, Grade 3: ≥ 5 episodes.

1 ^g Grade 2: skipped 2 meals, Grade 3: skipped ≥ 3 meals.

2 ^h Oral equivalent temperature; Grade 2: 38.5°C to 39.4°C, Grade 3: $\geq 39.5^\circ\text{C}$.

3 ⁱ Grade 2: 2 episodes, Grade 3: ≥ 3 episodes.

4 ^j These solicited adverse events were reported as present or absent only.

5 Note: During the study Grade 1, Grade 2, and Grade 3 were collected as Mild, Moderate, and Severe respectively.

6

7

1 **Table 4: Percentage of Participants 18 Years Through 55 Years of Age Reporting Solicited**
2 **Adverse Reactions Within 7 Days Following Vaccine Administration With a Single Dose**

Reaction	Menactra N ^a =1371			Menomune – A/C/Y/W-135 N ^a =1159		
	Any	Grade 2	Grade 3	Any	Grade 2	Grade 3
Local/Injection Site						
Pain ^b	53.9 ^c	11.3 ^c	0.2	48.1	3.3	0.1
Induration ^d	17.1 ^c	3.4 ^c	0.7 ^c	11.0	1.0	0.0
Redness ^d	14.4	2.9	1.1 ^c	16.0	1.9	0.1
Swelling ^d	12.6 ^c	2.3 ^c	0.9 ^c	7.6	0.7	0.0
Systemic						
Headache ^e	41.4	10.1	1.2	41.8	8.9	0.9
Fatigue ^e	34.7	8.3	0.9	32.3	6.6	0.4
Malaise ^e	23.6	6.6 ^c	1.1	22.3	4.7	0.9
Arthralgia ^e	19.8 ^c	4.7 ^c	0.3	16.0	2.6	0.1
Diarrhea ^f	16.0	2.6	0.4	14.0	2.9	0.3
Anorexia ^g	11.8	2.3	0.4	9.9	1.6	0.4
Chills ^e	9.7 ^c	2.1 ^c	0.6 ^c	5.6	1.0	0.0
Vomiting ^h	2.3	0.4	0.2	1.5	0.2	0.4
Fever ⁱ	1.5 ^c	0.3	0.0	0.5	0.1	0.0
Rash ^j	1.4	-	-	0.8	-	-
Seizure ^j	0.0	-	-	0.0	-	-

3 ^aN = The number of participants with available data.

4 ^bGrade 2: interferes with or limits usual arm movement, Grade 3: disabling, unable to move arm.

5 ^cDenotes $p < 0.05$ level of significance. The p -values were calculated for each category and severity using Chi Square
6 test.

7 ^dGrade 2: 1.0-2.0 inches, Grade 3: >2.0 inches.

8 ^eGrade 2: interferes with normal activities, Grade 3: requiring bed rest.

9 ^fGrade 2: 3-4 episodes, Grade 3: ≥ 5 episodes.

1 ^g Grade 2: skipped 2 meals, Grade 3: skipped ≥ 3 meals.

2 ^h Grade 2: 2 episodes, Grade 3: ≥ 3 episodes.

3 ⁱ Oral equivalent temperature; Grade 2: 39.0°C to 39.9°C, Grade 3: ≥ 40.0 °C.

4 ^j These solicited adverse events were reported as present or absent only.

5 Note: During the study Grade 1, Grade 2, and Grade 3 were collected as Mild, Moderate, and Severe respectively.

6

7 ***Solicited Adverse Events in a Booster Vaccination Study***

8 For a description of the study design and number of participants, [see *Clinical Trials Experience*,
9 *Booster Vaccination Study (6.1)*]. The most common solicited injection site and systemic
10 reactions within 7 days of vaccination were pain (60.2%) and myalgia (42.8%), respectively.

11 Overall rates of solicited injection site reactions and solicited systemic reactions were similar to
12 those observed in adolescents and adults after a single Menactra dose. The majority of solicited
13 reactions were Grade 1 or 2 and resolved within 3 days.

14

15 ***Adverse Events in Concomitant Vaccine Studies***

16 **Solicited Injection Site and Systemic Reactions when Given with Routine Pediatric Vaccines**

17 For a description of the study design and number of participants, [see *Clinical Trials Experience*
18 *(6.1)*, *Concomitant Vaccine Administration (14.3)*]. In the primary safety study, 1378 US children
19 were enrolled to receive Menactra alone at 9 months of age and Menactra plus one or more other
20 routinely administered vaccines (MMRV, PCV7 and HepA) at 12 months of age (N=961).

21 Another group of children received two or more routinely administered vaccines (MMRV, PCV7
22 and HepA) (control group, n=321) at 12 months of age. The frequency of occurrence of solicited
23 adverse events is presented in [Table 1](#). Participants who received Menactra and the concomitant

1 vaccines at 12 months of age described above reported similar frequencies of tenderness, redness
2 and swelling at the Menactra injection site and at the concomitant vaccine injection sites.
3 Tenderness was the most frequent injection site reaction (48%, 39%, 46% and 43% at the
4 Menactra, MMRV, PCV7 and HepA sites, respectively). Irritability was the most frequent
5 systemic reaction, reported in 62% of recipients of Menactra plus concomitant vaccines, and 65%
6 of the control group. [See *Concomitant Vaccine Administration (14.3)*.]
7

8 In a randomized, parallel group, US multi-center clinical trial conducted in children 4 through 6
9 years of age, Menactra was administered as follows: 30 days after concomitant DAPTACEL®,
10 Diphtheria and Tetanus Toxoids and Acellular Pertussis Vaccine Adsorbed, (DTaP),
11 manufactured by Sanofi Pasteur Limited + IPOL®, Poliovirus Vaccine Inactivated, (IPV),
12 manufactured by Sanofi Pasteur SA [Group A]; concomitantly with DAPTACEL followed 30
13 days later by IPV [Group B]; concomitantly with IPV followed 30 days later by DAPTACEL
14 [Group C]. Solicited injection site and systemic reactions were recorded in a diary card for 7
15 consecutive days after each vaccination. For all study groups, the most frequently reported
16 solicited local reaction at the Menactra site was pain: 52.2%, 60.9% and 56.0% of participants in
17 Groups A, B and C, respectively. For all study groups, the most frequently reported systemic
18 reaction following the administration of Menactra alone or with the respective concomitant
19 vaccines was myalgia: 24.2%, 37.3% and 26.7% of participants in Groups A, B and C,
20 respectively. Fever >39.5°C occurred at <1.0% in all groups. [See *Concomitant Vaccine
21 Administration (14.3)*.]
22

1 **Solicited Injection Site and Systemic Reactions when Given with Tetanus and Diphtheria**
2 **Toxoid Adsorbed Vaccine**

3 In a clinical study, rates of local and systemic reactions after Menactra and Tetanus and
4 Diphtheria Toxoid Adsorbed (Td) vaccine manufactured by Sanofi Pasteur Inc. were compared
5 [see *Drug Interactions (7)*, and *Concomitant Vaccine Administration (14.3)* for study description].
6 Injection site pain was reported more frequently after Td vaccination than after Menactra
7 vaccination (71% versus 53%). The overall rate of systemic adverse events was higher when
8 Menactra and Td vaccines were given concomitantly than when Menactra was administered 28
9 days after Td vaccine (59% versus 36%). In both groups, the most common reactions were
10 headache (Menactra + Td vaccine, 36%; Td vaccine + Placebo, 34%; Menactra alone, 22%) and
11 fatigue (Menactra + Td vaccine, 32%; Td vaccine + Placebo, 29%; Menactra alone, 17%). Fever
12 $\geq 40.0^{\circ}\text{C}$ occurred at $\leq 0.5\%$ in all groups.

13

14 **Solicited Injection Site and Systemic Reactions when Given with Typhoid Vi Polysaccharide**
15 **Vaccine**

16 In a clinical study, rates of local and systemic reactions after Menactra and Typhim Vi® [Typhoid
17 Vi Polysaccharide Vaccine] (Typhoid), produced by Sanofi Pasteur SA were compared [see *Drug*
18 *Interactions (7)* and *Concomitant Vaccine Administration (14.3)*] for a description of the
19 concomitantly administered vaccine, study design and number of participants. More participants
20 experienced pain after Typhoid vaccination than after Menactra vaccination (Typhoid + Placebo,
21 76% versus Menactra + Typhoid, 47%). The majority (70%-77%) of injection site solicited
22 reactions for both groups at either injection site were reported as Grade 1 and resolved within 3 days
23 post-vaccination. In both groups, the most common systemic reaction was headache (Menactra +

1 Typhoid, 41%; Typhoid + Placebo, 42%; Menactra alone, 33%) and fatigue (Menactra + Typhoid,
2 38%; Typhoid + Placebo, 35%; Menactra alone, 27%). Fever $\geq 40.0^{\circ}\text{C}$ and seizures were not
3 reported in either group.

4

5 **6.2 Post-Marketing Experience**

6 In addition to reports in clinical trials, worldwide voluntary adverse events reports received since
7 market introduction of Menactra are listed below. This list includes serious events and/or events
8 which were included based on severity, frequency of reporting or a plausible causal connection to
9 Menactra. Because these events were reported voluntarily from a population of uncertain size, it is
10 not possible to reliably estimate their frequency or establish a causal relationship to vaccination.

11

- 12 • *Blood and Lymphatic System Disorders*

13 Lymphadenopathy

14

- 15 • *Immune System Disorders*

16 Hypersensitivity reactions such as anaphylaxis/anaphylactic reaction, wheezing, difficulty

17 breathing, upper airway swelling, urticaria, erythema, pruritus, hypotension

18

- 19 • *Nervous System Disorders*

20 Guillain-Barré syndrome, paraesthesia, vasovagal syncope, dizziness, convulsion, facial

21 palsy, acute disseminated encephalomyelitis, transverse myelitis

22

- 23 • *Musculoskeletal and Connective Tissue Disorders*

1 **Myalgia**

- 2
- 3 • *General Disorders and Administrative Site Conditions*

4 Large injection site reactions, extensive swelling of the injected limb (may be associated
5 with erythema, warmth, tenderness or pain at the injection site).

6

7 ***Post-marketing Safety Study***

8 The risk of GBS following receipt of Menactra was evaluated in a US retrospective cohort study
9 using healthcare claims data from 9,578,688 individuals 11 through 18 years of age, of whom
10 1,431,906 (15%) received Menactra. Of 72 medical chart-confirmed GBS cases, none had
11 received Menactra within 42 days prior to symptom onset. An additional 129 potential cases of
12 GBS could not be confirmed or excluded due to absent or insufficient medical chart information.
13 In an analysis that took into account the missing data, estimates of the attributable risk of GBS
14 ranged from 0 to 5 additional cases of GBS per 1,000,000 vaccinees within the 6-week period
15 following vaccination.

16

17 **7 DRUG INTERACTIONS**

18 **7.1 Concomitant Administration with Other Vaccines**

19 Menactra vaccine was concomitantly administered with Typhim Vi® [Typhoid Vi Polysaccharide
20 Vaccine] (Typhoid) and Tetanus and Diphtheria Toxoids Adsorbed, For Adult Use (Td) vaccine,
21 in individuals 18 through 55 and 11 through 17 years of age, respectively. In children 4 through 6
22 years of age, Menactra was co-administered with DAPTACEL, and in children younger than 2

1 years of age, Menactra was co-administered with one or more of the following vaccines: PCV7,
2 MMR, V, MMRV, or HepA [see *Clinical Studies (14)* and *Adverse Reactions (6)*].

3

4 When Menactra and DAPTACEL are to be administered to children 4 through 6 years of age,
5 preference should be given to simultaneous administration of the 2 vaccines or administration of
6 Menactra prior to DAPTACEL. Administration of Menactra one month after DAPTACEL has
7 been shown to reduce meningococcal antibody responses to Menactra. Data are not available to
8 evaluate the immune response to Menactra administered to younger children following
9 DAPTACEL or to Menactra administered to persons <11 years of age following other diphtheria
10 toxoid-containing vaccines [see *Clinical Studies (14.3)*].

11

12 Pneumococcal antibody responses to some serotypes in PCV7 were decreased following co-
13 administration of Menactra and PCV7 [see *Concomitant Vaccine Administration (14.3)*].

14

15 Do not mix Menactra with other vaccines in the same syringe. When Menactra is administered
16 concomitantly with other injectable vaccines, the vaccines should be administered with different
17 syringes and given at separate injection sites.

18

19 **7.2 Immunosuppressive Therapies**

20 Immunosuppressive therapies, including irradiation, antimetabolites, alkylating agents, cytotoxic
21 drugs, and corticosteroids (used in greater than physiologic doses) may reduce the immune
22 response to vaccines.

23

8 USE IN SPECIFIC POPULATIONS

8.1 Pregnancy

Pregnancy Exposure Registry

There is a pregnancy exposure registry that monitors pregnancy outcomes in women exposed to Menactra during pregnancy. To enroll in or obtain information about the registry, call Sanofi Pasteur at 1-800-822-2463.

Risk Summary

All pregnancies have a risk of birth defect, loss, or other adverse outcomes. In the US general population, the estimated background risk of major birth defects and miscarriage in clinically recognized pregnancies is 2% to 4% and 15% to 20%, respectively. There are no adequate and well-controlled studies of Menactra administration in pregnant women in the US. Available data suggest that rates of major birth defects and miscarriage in women who received Menactra 30 days prior to pregnancy or during pregnancy are consistent with estimated background rates.

A developmental toxicity study was performed in female mice given 0.1 mL (in divided doses) of Menactra prior to mating and during gestation (a single human dose is 0.5 mL). The study revealed no evidence of harm to the fetus due to Menactra [see *Animal Data (8.1)*].

Data

Human Data

A pregnancy registry spanning 11 years (2005-2016) included 222 reports of exposure to Menactra from 30 days before or at any time during pregnancy. Of these reports, 87 had known

1 pregnancy outcomes available and were enrolled in the pregnancy registry prior to the outcomes
2 being known. Outcomes among these prospectively followed pregnancies included 2 major birth
3 defects and 6 miscarriages.

4

5 *Animal Data*

6 A developmental toxicity study was performed in female mice. The animals were administered
7 0.1 mL of Menactra (in divided doses) at each of the following time points: 14 days prior to
8 mating, and on Days 6 and 18 of gestation (a single human dose is 0.5 mL). There were no
9 vaccine-related fetal malformations or variations, and no adverse effects on pre-weaning
10 development observed in the study.

11

12 **8.2 Lactation**

13 Risk Summary

14 The developmental and health benefits of breastfeeding should be considered along with the
15 mother's clinical need for Menactra and any potential adverse effects on the breastfed child from
16 Menactra. Data are not available to assess the effects of Menactra on the breastfed infant or on
17 milk production/excretion.

18

19 **8.4 Pediatric Use**

20 Menactra is not approved for use in infants under 9 months of age. Available data show that
21 infants administered three doses of Menactra (at 2, 4, and 6 months of age) had diminished
22 responses to each meningococcal vaccine serogroup compared to older children given two doses
23 at 9 and 12 months of age.

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8.5 Geriatric Use

Safety and effectiveness of Menactra in adults older than 55 years of age have not been established.

11 DESCRIPTION

Menactra is a sterile, intramuscularly administered vaccine that contains *N meningitidis* serogroup A, C, Y and W-135 capsular polysaccharide antigens individually conjugated to diphtheria toxoid protein. *N meningitidis* A, C, Y and W-135 strains are cultured on Mueller Hinton agar (3) and grown in Watson Scherp (4) media containing casamino acid. The polysaccharides are extracted from the *N meningitidis* cells and purified by centrifugation, detergent precipitation, alcohol precipitation, solvent extraction and diafiltration. To prepare the polysaccharides for conjugation, they are depolymerized, derivatized, and purified by diafiltration. Diphtheria toxin is derived from *Corynebacterium diphtheriae* grown in modified culture medium containing hydrolyzed casein (5) and is detoxified using formaldehyde. The diphtheria toxoid protein is purified by ammonium sulfate fractionation and diafiltration. The derivatized polysaccharides are covalently linked to diphtheria toxoid and purified by serial diafiltration. The four meningococcal components, present as individual serogroup-specific glycoconjugates, compose the final formulated vaccine. No preservative or adjuvant is added during manufacture. Each 0.5 mL dose may contain residual amounts of formaldehyde of less than 2.66 mcg (0.000532%), by calculation. Potency of Menactra is determined by quantifying the amount of each polysaccharide antigen that is conjugated to diphtheria toxoid protein and the amount of unconjugated polysaccharide present.

1 Menactra is manufactured as a sterile, clear to slightly turbid liquid. Each 0.5 mL dose of vaccine
2 is formulated in sodium phosphate buffered isotonic sodium chloride solution to contain 4 mcg
3 each of meningococcal A, C, Y and W-135 polysaccharides conjugated to approximately 48 mcg
4 of diphtheria toxoid protein carrier.

5

6 The vial stopper is not made with natural rubber latex.

7

8 **12 CLINICAL PHARMACOLOGY**

9 **12.1 Mechanism of Action**

10 The presence of bactericidal anti-capsular meningococcal antibodies has been associated with
11 protection from invasive meningococcal disease (6) (7). Menactra induces the production of
12 bactericidal antibodies specific to the capsular polysaccharides of serogroups A, C, Y and W-135.

13

14 **13 NON-CLINICAL TOXICOLOGY**

15 **13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility**

16 Menactra has not been evaluated for carcinogenic or mutagenic potential, or for impairment of
17 male fertility. A developmental animal toxicity study showed that Menactra had no effects on
18 female fertility in mice [see *Pregnancy* (8.1)].

19

20 **14 CLINICAL STUDIES**

21 **14.1 Efficacy**

22 The serum bactericidal assay (SBA) used to test sera contained an exogenous complement source
23 that was either human (SBA-H) or baby rabbit (SBA-BR). (8)

1

2 The response to vaccination following two doses of vaccine administered to children 9 and 12
3 months of age and following one dose of vaccine administered to children 2 through 10 years of
4 age was evaluated by the proportion of participants having an SBA-H antibody titer of 1:8 or
5 greater, for each serogroup. In individuals 11 through 55 years of age, the response to vaccination
6 with a single dose of vaccine was evaluated by the proportion of participants with a 4-fold or
7 greater increase in bactericidal antibody to each serogroup as measured by SBA-BR. For
8 individuals 2 through 55 years of age, vaccine efficacy after a single dose was inferred from the
9 demonstration of immunologic equivalence to a US-licensed meningococcal polysaccharide
10 vaccine, Menomune – A/C/Y/W-135 vaccine as assessed by SBA.

11

12 **14.2 Immunogenicity**

13 *Children 9 through 12 Months of Age*

14 In a randomized, US, multi-center trial, children received Menactra at 9 months and 12 months of
15 age. The first Menactra dose was administered alone, followed by a second Menactra dose given
16 alone (N=404), or with MMRV (N=302), or with PCV7 (N=422). For all participants, sera were
17 obtained approximately 30 days after last vaccination. There were no substantive differences in
18 demographic characteristics between the vaccine groups. The median age range for administration
19 of the first dose of Menactra was 278-279 days of age.

20

1 **Table 5: Bactericidal Antibody Responses^a 30 Days Following a Second Dose of Menactra**
 2 **Administered Alone or Concomitantly Administered with MMRV or PCV7 at 12 Months of**
 3 **Age**

		Vaccinations administered at 12 months of age following a dose of Menactra at 9 months of age					
		Menactra		Menactra + MMRV		Menactra + PCV7	
		(N=272-277) ^b		(N=177-180) ^b		(N=264-267) ^b	
Serogroup			(95% CI) ^c		(95% CI) ^c		(95% CI) ^c
A	% ≥1:8 ^d	95.6	(92.4; 97.7)	92.7	(87.8; 96.0)	90.5	(86.3; 93.8)
	GMT	54.9	(46.8; 64.5)	52.0	(41.8; 64.7)	41.0	(34.6; 48.5)
C	% ≥1:8 ^d	100.0	(98.7; 100.0)	98.9	(96.0; 99.9)	97.8	(95.2; 99.2)
	GMT	141.8	(123.5; 162.9)	161.9	(136.3; 192.3)	109.5	(94.1; 127.5)
Y	% ≥1:8 ^d	96.4	(93.4; 98.2)	96.6	(92.8; 98.8)	95.1	(91.8; 97.4)
	GMT	52.4	(45.4; 60.6)	60.2	(50.4; 71.7)	39.9	(34.4; 46.2)
W-135	% ≥1:8 ^d	86.4	(81.8; 90.3)	88.2	(82.5; 92.5)	81.2	(76.0; 85.7)
	GMT	24.3	(20.8; 28.3)	27.9	(22.7; 34.3)	17.9	(15.2; 21.0)

4 ^a Serum bactericidal assay with an exogenous human complement (SBA-H) source.

5 ^b N=Number of participants with at least one valid serology result from a blood sample obtained between Days 30 to
 6 44 post vaccination.

7 ^c 95% CIs for the proportions are calculated based on the Clopper-Pearson Exact method and normal approximation
 8 for that of the GMTs.

9 ^d The proportion of participants achieving an SBA-H titer of at least 1:8 thirty days after the second dose of Menactra.

10

1 Administration of Menactra to children at 12 months and 15 months of age was evaluated in a US
2 study. Prior to the first dose, 33.3% [n=16/48] of participants had an SBA-H titer $\geq 1:8$ to
3 Serogroup A, and 0-2% [n=0-1 of 50-51] to Serogroups C, Y and W-135. After the second dose,
4 percentages of participants with an SBA-H titer $\geq 1:8$ were: 85.2%, Serogroup A [n=46/54];
5 100.0%, Serogroup C [n=54/54]; 96.3%, Serogroup Y [n=52/54]; 96.2%, Serogroup W-135
6 [n=50/52].

7

8 *Individuals 2 through 55 Years of Age*

9 Immunogenicity was evaluated in three comparative, randomized, US, multi-center, active
10 controlled clinical trials that enrolled children (2 through 10 years of age), adolescents (11
11 through 18 years of age), and adults (18 through 55 years of age). Participants received a single
12 dose of Menactra (N=2526) or Menomune – A/C/Y/W-135 (N=2317). For all age groups studied,
13 sera were obtained before and approximately 28 days after vaccination. [Blinding procedures for
14 safety assessments are described in *Adverse Reactions (6)*.]

15

16 In each of the trials, there were no substantive differences in demographic characteristics between
17 the vaccine groups, between immunogenicity subsets or the overall study population. In the study
18 of children 2 through 10 years of age, the median age of participants was 3 years; 95% completed
19 the study. In the adolescent trial, the median age for both groups was 14 years; 99% completed the
20 study. In the adult trial, the median age for both groups was 24 years; 94% completed the study.

21

1 *Immunogenicity in Children 2 through 10 Years of Age*

2 Of 1408 enrolled children 2 through 10 years of age, immune responses evaluated in a subset of
3 Menactra participants (2 through 3 years of age, n=52; 4-10 years of age, n=84) and Menomune –
4 A/C/Y/W-135 participants (2 through 3 years of age, n=53; 4-10 years of age, n=84) were
5 comparable for all four serogroups ([Table 6](#)).

6

7

1 **Table 6: Comparison of Bactericidal Antibody Responses^a to Menactra and Menomune –**
 2 **A/C/Y/W-135 28 Days after Vaccination for a Subset of Participants 2 through 3 Years of**
 3 **Age and 4 through 10 Years of Age**

		Ages 2 through 3 Years				Ages 4 through 10 Years			
		Menactra		Menomune – A/C/Y/W-135		Menactra		Menomune – A/C/Y/W-135	
		N ^b =48-52		N ^b =50-53		N ^b =84		N ^b =84	
Serogroup			(95% CI) ^c		(95% CI) ^c		(95% CI) ^c		(95% CI) ^c
A	% ≥1:8 ^d	73	(59,84)	64	(50,77)	81	(71,89)	55	(44,66)
	GMT	10	(8,13)	10	(7,12)	19	(14,26)	7	(6,9)
C	% ≥1:8 ^d	63	(48,76)	38	(25,53)	79	(68,87)	48	(37,59)
	GMT	27	(14,52)	11	(5,21)	28	(19,41)	12	(7,18)
Y	% ≥1:8 ^d	88	(75,95)	73	(59,84)	99	(94,100)	92	(84,97)
	GMT	51	(31,84)	18	(11,27)	99	(75,132)	46	(33,66)
W-135	% ≥1:8 ^d	63	(47,76)	33	(20,47)	85	(75,92)	79	(68,87)
	GMT	15	(9,25)	5	(3,6)	24	(18,33)	20	(14,27)

4 ^a Serum bactericidal assay with an exogenous human complement (SBA-H) source.

5 ^b N=Number of subset participants with at least one valid serology result at Day 0 and Day 28.

6 ^c The 95% CI for the Geometric Mean Titer (GMT) was calculated based on an approximation to the normal
 7 distribution.

8 ^d The proportion of participants achieving an SBA-H titer of at least 1:8 was assessed using a 10% non-inferiority
 9 margin and a one-sided Type 1 error rate of 0.025.

10

11 In the subset of participants 2 through 3 years of age with undetectable pre-vaccination titers (ie,
 12 SBA-H titers <1:4 at Day 0), seroconversion rates (defined as the proportions of participants with

1 SBA-H titers $\geq 1:8$ by Day 28) were similar between the Menactra and Menomune – A/C/Y/W-
2 135 recipients. Menactra participants achieved seroconversion rates of: 57%, Serogroup A
3 (n=12/21); 62%, Serogroup C (n=29/47); 84%, Serogroup Y (n=26/31); 53%, Serogroup W-135
4 (n=20/38). The seroconversion rates for Menomune – A/C/Y/W-135 recipients were: 55%,
5 Serogroup A (n=16/29); 30%, Serogroup C (n=13/43); 57%, Serogroup Y (n=17/30); 26%,
6 Serogroup W-135 (n=11/43).

7

8 In the subset of participants 4 through 10 years of age with undetectable pre-vaccination titers (ie,
9 SBA-H titers $< 1:4$ at Day 0), seroconversion rates (defined as the proportions of participants with
10 SBA-H titers $\geq 1:8$ by Day 28) were similar between the Menactra and Menomune – A/C/Y/W-
11 135 recipients. Menactra participants achieved seroconversion rates of: 69%, Serogroup A
12 (n=11/16); 81%, Serogroup C (n=50/62); 98%, Serogroup Y (n=45/46); 69%, Serogroup W-135
13 (n=27/39). The seroconversion rates for Menomune – A/C/Y/W-135 recipients were: 48%,
14 Serogroup A (n=10/21); 38%, Serogroup C (n=19/50); 84%, Serogroup Y (n=38/45); 68%,
15 Serogroup W-135 (n=26/38).

16

17 *Immunogenicity in Adolescents 11 through 18 Years of Age*

18 Results from the comparative clinical trial conducted in 881 adolescents aged 11 through 18 years
19 showed that the immune responses to Menactra and Menomune – A/C/Y/W-135 were similar for
20 all four serogroups (Table 7).

21

22 In participants with undetectable pre-vaccination titers (ie, SBA-BR titers $< 1:8$ at Day 0),
23 seroconversion rates (defined as the proportions of participants achieving a ≥ 4 -fold rise in SBA-

1 BR titers by Day 28) were similar between the Menactra and Menomune – A/C/Y/W-135
2 recipients. Menactra participants achieved seroconversion rates of: 100%, Serogroup A
3 (n=81/81); 99%, Serogroup C (n=153/155); 98%, Serogroup Y (n=60/61); 98%, Serogroup W-
4 135 (n=161/164). The seroconversion rates for Menomune – A/C/Y/W-135 recipients were:
5 100%, Serogroup A (n=93/93); 99%, Serogroup C (n=151/152); 100%, Serogroup Y (n=47/47);
6 99%, Serogroup W-135 (n=138/139).

7

8 *Immunogenicity in Adults 18 through 55 Years of Age*

9 Results from the comparative clinical trial conducted in 2554 adults aged 18 through 55 years
10 showed that the immune responses to Menactra and Menomune – A/C/Y/W-135 were similar for
11 all four serogroups ([Table 7](#)).

12

13

1 **Table 7: Comparison of Bactericidal Antibody Responses^a to Menactra and Menomune –**
 2 **A/C/Y/W-135 28 Days after Vaccination for Participants 11 through 18 Years of Age and 18**
 3 **through 55 Years of Age**

		Ages 11 through 18 Years				Ages 18 through 55 Years			
		Menactra		Menomune – A/C/Y/W-135		Menactra		Menomune – A/C/Y/W-135	
		N ^b =423		N ^b =423		N ^b =1280		N ^b =1098	
Serogroup			(95% CI) ^c		(95% CI) ^c		(95% CI) ^c		(95% CI) ^c
A	% ≥4-fold rise ^d	92.7	(89.8, 95.0)	92.4	(89.5, 94.8)	80.5	(78.2, 82.6)	84.6	(82.3, 86.7)
	GMT	5483	(4920, 6111)	3246	(2910, 3620)	3897	(3647, 4164)	4114	(3832, 4417)
C	% ≥4-fold rise ^d	91.7	(88.7, 94.2)	88.7	(85.2, 91.5)	88.5	(86.6, 90.2)	89.7	(87.8, 91.4)
	GMT	1924	(1662, 2228)	1639	(1406, 1911)	3231	(2955, 3533)	3469	(3148, 3823)
Y	% ≥4-fold rise ^d	81.8	(77.8, 85.4)	80.1	(76.0, 83.8)	73.5	(71.0, 75.9)	79.4	(76.9, 81.8)
	GMT	1322	(1162, 1505)	1228	(1088, 1386)	1750	(1597, 1918)	2449	(2237, 2680)
W-135	% ≥4-fold rise ^d	96.7	(94.5, 98.2)	95.3	(92.8, 97.1)	89.4	(87.6, 91.0)	94.4	(92.8, 95.6)
	GMT	1407	(1232, 1607)	1545	(1384, 1725)	1271	(1172, 1378)	1871	(1723, 2032)

4 ^a Serum bactericidal assay with baby rabbit complement (SBA-BR).

5 ^b N=Number of subset participants with at least one valid serology result at Day 0 and Day 28.

6 ^c The 95% CI for the Geometric Mean Titer (GMT) was calculated based on an approximation to the normal
 7 distribution.

8 ^d Menactra was non-inferior to Menomune – A/C/Y/W-135. Non-inferiority was assessed by the proportion of
 9 participants with a 4-fold or greater rise in SBA-BR titer for *N meningitidis* serogroups A, C, Y and W-135 using a
 10 10% non-inferiority margin and a one-sided Type I error rate of 0.05.

1 In participants with undetectable pre-vaccination titers (ie, SBA-BR titers <1:8 at Day 0),
2 seroconversion rates (defined as the proportions of participants achieving a ≥ 4 -fold rise in SBA-
3 BR titers by Day 28) were similar between the Menactra and Menomune – A/C/Y/W-135
4 recipients. Menactra participants achieved seroconversion rates of: 100%, Serogroup A
5 (n=156/156); 99%, Serogroup C (n=343/345); 91%, Serogroup Y (n=253/279); 97%, Serogroup
6 W-135 (n=360/373). The seroconversion rates for Menomune – A/C/Y/W-135 recipients were:
7 99%, Serogroup A (n=143/144); 98%, Serogroup C (n=297/304); 97%, Serogroup Y
8 (n=221/228); 99%, Serogroup W-135 (n=325/328).

9

10 ***Immunogenicity in Adolescents and Adults Following Booster Vaccination***

11 For a description of the study design and number of participants, [see *Clinical Trials Experience*,
12 *Booster Vaccination Study (6.1)*.] Prior to revaccination, the percentage of participants (n=781)
13 with an SBA-H titer $\geq 1:8$ were 64.5%, 44.2%, 38.7%, and 68.5% for Serogroups A, C, Y and W-
14 135, respectively. Among the subset of trial participants (n=112) for whom SBA-H responses at
15 Day 6 were assessed, 86.6%, 91.1%, 94.6%, and 92.0% achieved a ≥ 4 -fold rise in SBA-H titer for
16 Serogroups A, C, Y and W-135, respectively. The proportions of participants (n=781) who
17 achieved a ≥ 4 -fold rise in SBA-H titer by Day 28 were 95.0%, 95.3%, 97.1%, and 96% for
18 Serogroups A, C, Y and W-135, respectively. The proportions of participants who achieved an
19 SBA-H titer $\geq 1:8$ by Day 28 were >99% for each serogroup.

20

21 **14.3 Concomitant Vaccine Administration**

1 ***MMRV (or MMR + V) or PCV7***

2 In a US, active-controlled trial, 1179 children received Menactra at 9 months and 12 months of
3 age. At 12 months of age these children received Menactra concomitantly with MMRV (N=616),
4 or MMR + V (N=48), or PCV7 (N=250). Another group of 12-month old children received
5 MMRV + PCV7 (N=485). Sera were obtained approximately 30 days after the last vaccinations.
6 Measles, mumps, rubella and varicella antibody responses among children who received Menactra
7 and MMRV (or MMR and V) were comparable to corresponding antibody responses among
8 children who received MMRV and PCV7.

9

10 When Menactra was given concomitantly with PCV7, the non-inferiority criteria for comparisons
11 of pneumococcal IgG GMCs (upper limit of the two-sided 95% CI of the GMC ratio ≤ 2) were not
12 met for 3 of 7 serotypes (4, 6B, 18C). In a subset of participants with available sera,
13 pneumococcal opsonophagocytic assay GMT data were consistent with IgG GMC data.

14

15 ***Td Vaccine***

16 In a double-blind, randomized, controlled trial, 1021 participants aged 11 through 17 years
17 received Td vaccine and Menactra concomitantly (N=509), or Td vaccine followed one month
18 later by Menactra (N=512). Sera were obtained approximately 28 days after each respective
19 vaccination. The proportions of participants with a 4-fold or greater increase in SBA-BR titer to
20 meningococcal Serogroups C, Y and W-135 were higher when Menactra was given concomitantly
21 with Td vaccine (86%-96%) than when Menactra was given one month following Td vaccine
22 (65%-91%). Anti-tetanus and anti-diphtheria antibody responses were similar in both study
23 groups.

1

2 ***Typhim Vi***

3 In a double-blind, randomized, controlled trial, 945 participants aged 18 through 55 years
4 received Typhim Vi and Menactra concomitantly (N=469), or Typhim Vi followed one month
5 later by Menactra (N=476). Sera were obtained approximately 28 days after each respective
6 vaccination. The antibody responses to Menactra and to Typhim Vi components were similar in
7 both study groups.

8

9 ***DAPTACEL and IPV***

10 In a randomized, parallel group, US multi-center clinical trial conducted in children 4 through 6
11 years of age, Menactra was administered as follows: 30 days after concomitant DTaP
12 (DAPTACEL®, Sanofi Pasteur Limited) + IPV (IPOL®, Sanofi Pasteur SA) [Group A];
13 concomitantly with DAPTACEL followed 30 days later by IPV [Group B]; concomitantly with
14 IPV followed 30 days later by DAPTACEL [Group C]. Sera were obtained approximately 30 days
15 after each respective vaccination. [See *Clinical Trials Experience (6.1)*.]

16

17 When Menactra was administered 30 days after DAPTACEL (and IPV) [Group A], significantly
18 lower SBA-H GMTs to all 4 meningococcal serogroups were observed compared to Menactra
19 (and IPV) administered 30 days prior to DAPTACEL [Group C]. When Menactra was
20 administered concomitantly with DAPTACEL [Group B], SBA-H GMTs to meningococcal
21 serogroups A, C, and W-135 were non-inferior to those observed after Menactra (and IPV)
22 [Group C]. The non-inferiority criterion was marginally missed for meningococcal serogroup Y.
23 Non-inferiority of SBA-H GMTs following concomitant administration of Menactra and

1 DAPTACEL compared to those after concomitant Menactra and IPV was concluded if the upper
2 limit of the 2-sided 95% CI of ($\text{GMT}_{\text{Group C}}$ divided by $\text{GMT}_{\text{Group B}}$) computed separately for each
3 of the serogroups was <2 .

4

5 The respective SBA-H GMTs and proportion (%) of Group A, B, and C study participants
6 achieving an SBA-H titer of $\geq 1:8$ are displayed in [Table 8](#).

7

1 **Table 8: Bactericidal Antibody Responses^a 30 Days Following Menactra Administered**
2 **Alone or Concomitantly with DAPTACEL or IPV**

		Vaccines administered at Visit 1 and 30 days later at Visit 2					
		Group A DAPTACEL + IPV Menactra		Group B Menactra + DAPTACEL IPV		Group C Menactra + IPV DAPTACEL	
		(N=250) ^b		(N=238) ^b		(N=121) ^b	
Serogroup			(95% CI) ^c		(95% CI) ^c		(95% CI) ^c
A	% ≥1:8 ^d	49.6	(41.0; 58.3)	67.2	(58.4; 75.1)	64.4	(54.4; 73.6)
	GMT	6.7	(5.7; 8.0)	10.8	(8.7; 13.3)	10.4	(8.1; 13.3)
C	% ≥1:8 ^d	20.3	(13.9; 28.0)	50.4	(41.5; 59.2)	50.5	(40.5; 60.5)
	GMT	3.3	(2.7; 3.9)	8.1	(6.3; 10.5)	7.8	(5.8; 10.7)
Y	% ≥1:8 ^d	44.2	(35.8; 52.9)	80.2	(72.3; 86.6)	88.5	(80.7; 93.9)
	GMT	6.5	(5.1; 8.2)	18.1	(14.2; 22.9)	26.2	(20.0; 34.4)
W-135	% ≥1:8 ^d	55.1	(46.4; 63.5)	87.8	(80.9; 92.9)	82.7	(74.0; 89.4)
	GMT	8.4	(6.7; 10.6)	22.8	(18.5; 28.1)	21.7	(16.6; 28.4)

3 ^a Serum bactericidal assay with an exogenous human complement (SBA-H) source.

4 ^b N=Total number of the subjects in the study population per group.

5 ^c 95% CIs for the proportions are calculated based on the Clopper-Pearson Exact method and normal approximation
6 for that of the GMTs.

7 ^d The proportion of participants achieving an SBA-H titer of at least 1:8, 30 days after Menactra.

8

1 When Menactra was administered concomitantly with DAPTACEL, antibody responses to three
2 of the pertussis antigens (pertussis toxin, filamentous hemagglutinin, and pertactin) (GMCs),
3 tetanus toxin (% participants with antibody concentrations ≥ 1.0 IU/mL), and diphtheria toxin (%
4 participants with antibody concentrations ≥ 1.0 IU/mL) were non-inferior to those observed after
5 DAPTACEL and IPV. The pertussis anti-fimbriae GMCs were marginally lower when Menactra
6 and DAPTACEL were administered concomitantly.

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1 **15 REFERENCES**

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1

2 **16 HOW SUPPLIED/STORAGE AND HANDLING**

3 **16.1 How Supplied**

- 4 • Single-dose vial, 0.5 mL (NDC 49281-589-58). Supplied as a package of 5 vials (NDC
5 49281-589-05).

6

7 **16.2 Storage and Handling**

8 Store at 2° to 8°C (35° to 46°F). DO NOT FREEZE. Frozen/previously frozen product should not
9 be used. Do not use after the expiration date.

10

11 **17 PATIENT COUNSELING INFORMATION**

12 Vaccine Information Statements are required by the National Childhood Vaccine Injury Act of
13 1986 to be given prior to immunization to the patient, parent, or guardian. These materials are
14 available free of charge at the Centers for Disease Control and Prevention (CDC) website
15 (www.cdc.gov/vaccines).

16

17 Inform the patients, parents or guardians about:

- 18 • Potential benefits and risks of immunization with Menactra.
- 19 • Potential for adverse reactions that have been temporally associated with administration of
20 Menactra or other vaccines containing similar components.
- 21 • Reporting any adverse reactions to their healthcare provider.
- 22 • The Sanofi Pasteur Inc. Pregnancy Registry, as appropriate [see *Pregnancy (8.1)*].

23

1 Menactra® is a registered trademark of Sanofi, its affiliates and subsidiaries.

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5 Manufactured by:

6 **Sanofi Pasteur Inc.**

7 Swiftwater PA 18370 USA

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