MenACWY-TT (MenQuadfi): Evidence to Recommendations Framework (EtR), Grading of Recommendations, Assessment, Development, and Evaluation (GRADE), and Workgroup Considerations

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Advisory Committee on Immunization Practices
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Outline

- Overview of MenACWY vaccines and recommendations
- Policy question
- Evidence to Recommendations framework
  - Problem
  - Benefits and Harms
    - Including GRADE
  - Values, acceptability, feasibility
  - Resource use
- Work group considerations

Serogroup A, C, W, and Y meningococcal vaccines

Vaccine product	Manufacturer	Trade name	Licensed for ages	Year licensed
MenACWY-D	Sanofi Pasteur	Menactra	9 mos–55 yrs	2005
MenACWY-CRM	GlaxoSmithKline	Menveo	2 mos–55 yrs	2010
MenACWY-TT^	Sanofi Pasteur	MenQuadfi	≥2 yrs	2020
MPSV4*	Sanofi Pasteur	Menomune	≥2 yrs	2014
MCV4-TT**	Pfizer	Nimenrix	NA	NA

MenACWY-D=Meningococcal groups A, C, W, and Y polysaccharide diphtheria toxoid conjugate vaccine
MenACWY-CRM=Meningococcal groups A, C, W, and Y oligosaccharide diphtheria CRM197 conjugate vaccine
MenACWY-TT=Meningococcal groups A, C, W, Y polysaccharide tetanus toxoid conjugate vaccine (^Contains 10µg each of serogroup A, C, W, and Y polysaccharides conjugated to 55µg tetanus toxoid carrier protein)
MPSV4=meningococcal polysaccharide vaccine, Groups A, C, Y and W combined
MCV4-TT=Meningococcal groups A, C, W, Y polysaccharide tetanus toxoid conjugate vaccine
*No longer available in the United States
**Never licensed in the United States, contains 5µg each of serogroup A, C, W, and Y polysaccharides conjugated to 44µg tetanus toxoid carrier protein

Serogroup A, C, W, and Y meningococcal vaccines

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MCV4-TT**	**Pfizer**	**Nimenrix**	**NA**	**NA**

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MenACWY vaccine recommendations

Population	Recommendation	Included in evidence profile
Adolescents aged 11 – 18 years	• 1 dose at age 11 or 12 • Booster at age 16	Yes
Persons with complement component deficiency, including patients taking a complement inhibitor	• 2 dose primary series • Booster every 3-5 years	No
Persons with functional or anatomic asplenia (including sickle cell disease)		
Persons with HIV infection		
Microbiologists routinely exposed to *Neisseria meningitidis*	• 1 dose • Booster every 5 years	Yes (first booster only)
Persons at increased risk during an outbreak	• 1 dose (booster if previously vaccinated)	Yes (if aged ≥2 years)
Persons who travel to or reside in countries where meningococcal disease is endemic or hyperendemic	• 1 dose • Booster if remains at increased risk	Yes (if aged ≥2 years)
Unvaccinated or under-vaccinated college freshmen living in residence halls	• 1 dose	Yes
Military recruits	• 1 dose • Booster every 5 years on basis of assignment	Yes

Policy question: Should MenACWY-TT (MenQuadfi) be included as an option for meningococcal ACWY vaccination according to currently recommended dosing and schedules?	
Population	Persons aged ≥ 2 years currently recommended to receive meningococcal ACWY conjugate vaccines
Intervention	Vaccination with MenACWY-TT according to currently recommended dosing and schedules
Comparison	Vaccination with MenACWY-D and MenACWY-CRM according to currently recommended dosing and schedules
Outcome	• Serogroup A, C, W, or Y meningococcal disease • Short-term immune response • Persistence of immune response • Immune interference due to co-administration with other routine adolescent vaccines • Serious adverse events

Outcomes ranking and inclusion in evidence profile

Type	Outcome	Importance	Included in evidence profile
Benefits	Serogroup A, C, W, or Y meningococcal disease	Critical	No
	Short-term immune response	**Critical**	**Yes**
	Persistence of immune response	**Important**	**Yes**
Harms	**Immune interference due to co-administration with other routine adolescent vaccines**	**Critical**	**Yes**
	Serious adverse events	**Critical**	**Yes**

Bold font indicates outcomes considered by the WG for GRADE analysis

Problem

- ACIP has recognized importance of meningococcal disease as a public health problem through existing vaccine recommendations
- Work Group felt question of whether to include MenACWY-TT as an option for meningococcal vaccination is of public health importance given recent vaccine licensure and to support security of vaccine supply

Benefits and Harms

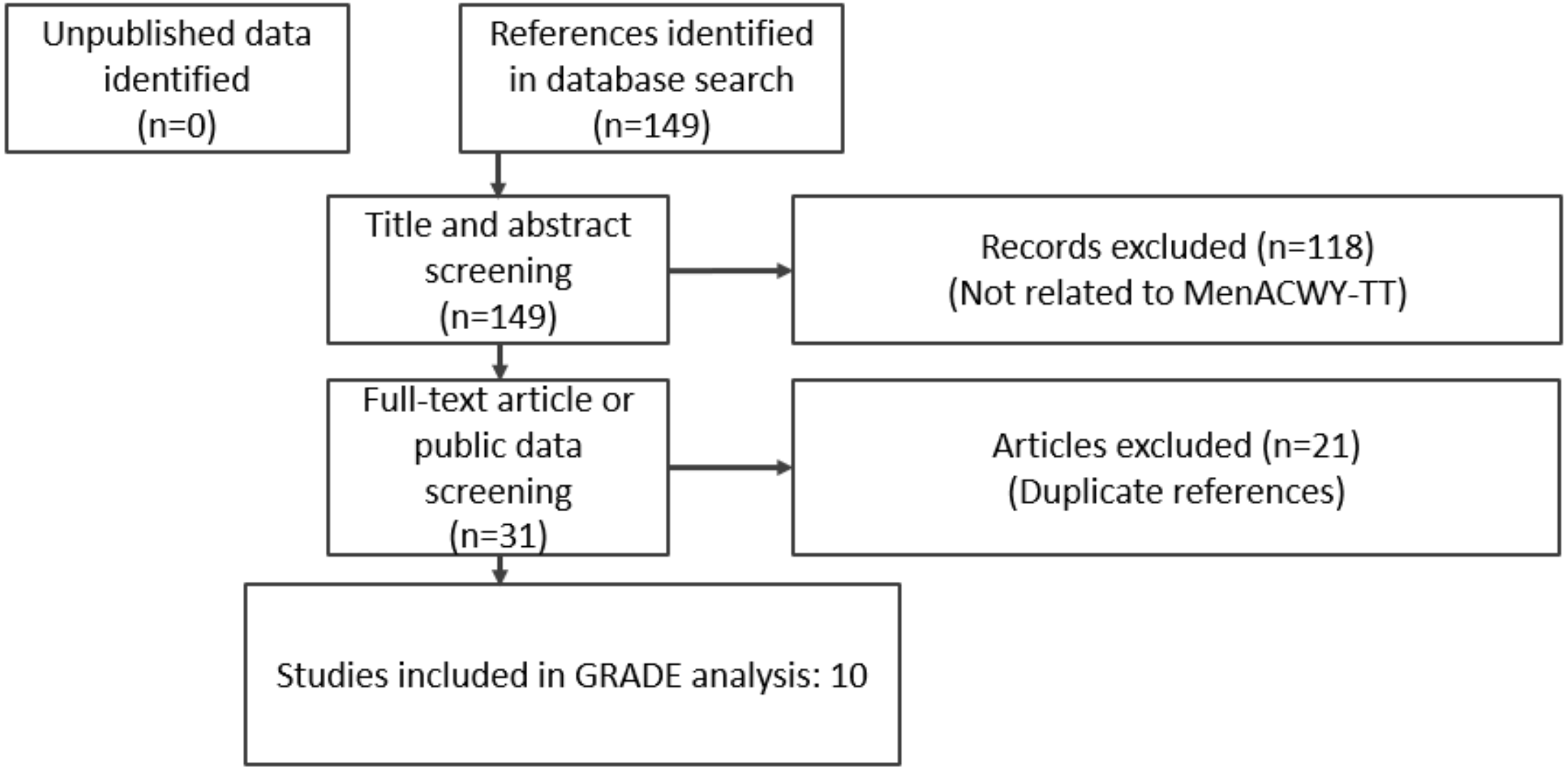
- How substantial are the desirable and undesirable anticipated effects?
- Certainty of evidence assessed via GRADE

Evidence Retrieval

- Systematic review of studies in any language from PubMed, Medline, Embase, CINAHL, Cochrane, Scopus, clinicaltrials.gov, and clinicaltrialsregister.eu databases using search string:
  - MenACYW-TT, MenACYWTT, MenACYW TT, MCV4-TT, MCV4TT, MCV4 TT, MenQuadfi, and “vaccin*” and “(immunogenicity or efficacy or effectiveness or impact or safety or adverse event*)”
- Efforts made to obtain unpublished or other relevant data
- Included studies that presented primary data on MenACWY-TT (MenQuadfi)

Note: MenACYW-TT is the content label for MenQuadfi used by the manufacturer in clinical trials. This differs from the content label for MenQuadfi used throughout the rest of the presentation, i.e. MenACWY-TT.

Evidence Retrieval



Studies included in review of evidence

Study Code	Study design	Population	Country	N (MenACWY-TT)	N (comparison)	Outcome
MET54	Phase II randomized, open-label	12-24 months	Finland	94	94	Immunogenicity, safety
MET51	Phase III randomized, modified double blind	12-23 months	Spain, Finland, Germany, Hungary	506	404	Immunogenicity, safety
MET35	Phase III randomized, modified double-blind	2-9 years	United States, Puerto Rico	480	482	Immunogenicity, safety
MET43	Phase III randomized, modified double-blind	10-17 years, 18-55 years	United States	1098, 1410**	300, 293**	Immunogenicity, safety
MET44	Phase II randomized, open label	56+ years	United States	201	100	Immunogenicity, safety
MET49	Phase III randomized, modified double-blind	56+ years	United States, Puerto Rico	448	453	Immunogenicity, safety
MET56*	Phase III randomized, modified double-blind	15+ years	United States, Puerto Rico	403	407	Immunogenicity, safety
MET50	Phase II randomized, open-label	10-17 years	United States	499, 391^	500, 296^	Immunogenicity, safety, coadministration
MET57	Phase III randomized, open-label	12-23 months	Mexico, Russia, South Korea, Thailand	294, 589^	294	Safety, coadministration
MET62*	Phase III open-label; follow-up to MET54	4-5 years	Finland	42	49	Safety, persistence

*Safety and/or immunogenicity evaluated after booster dose **N's for 10-17y and 18-55y age groups, respectively ^N's in meningococcal vaccine only and co-administration groups, respectively

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Persons with underlying medical conditions were excluded from evaluated studies

Population	Recommendation	Included in evidence profile
Adolescents aged 11 – 18 years	• 1 dose at age 11 or 12 • Booster at age 16	Yes
Persons with complement component deficiency, including patients taking a complement inhibitor	• 2 dose primary series • Booster every 3-5 years	No
Persons with functional or anatomic asplenia (including sickle cell disease)		
Persons with HIV infection		
Microbiologists routinely exposed to *Neisseria meningitidis*	• 1 dose • Booster every 5 years	Yes (first booster only)
Persons at increased risk during an outbreak	• 1 dose (booster if previously vaccinated)	Yes (if aged ≥2 years)
Persons who travel to or reside in countries where meningococcal disease is endemic or hyperendemic	• 1 dose • Booster if remains at increased risk	Yes (if aged ≥2 years)
Unvaccinated or under-vaccinated college freshmen living in residence halls	• 1 dose	Yes
Military recruits	• 1 dose • Booster every 5 years on basis of assignment	Yes

Short-term immune response data example
MET50, Ages 10-17
Comparator MenACWY-CRM

Serogroup	Geometic Mean Titers (GMT) MenACWY-TT	GMT MenACWY-CRM	GMT Ratios (GMTR)*	% seroresponders^ MenACWY-TT	% seroresponders^ MenACWY-CRM	Absolute difference in % seroresponders** (95% CI)
A	44.1	35.2	1.25	75.6	66.4	9.2 (3.4-15.0)
C	387.0	51.4	7.53	97.2	72.6	24.6 (20.3-29.0)
W	86.9	36.0	2.41	86.2	66.6	19.6 (14.2-24.8)
Y	75.7	27.6	2.74	97.0	80.8	16.2 (12.3-20.2)

*Calculated as [GMT (MenACWY-TT)] / [GMT (MenACWY-CRM)]
^Post-vaccination titer of ≥1:16 for subjects with pre-vaccination titer <1:8; 4-fold increase in titer post-vaccination for subjects with pre-vaccination titer ≥1:8
**Calculated as [% seroresponders (MenACWY-TT)] – [% seroresponders (MenACWY-CRM)]

Summary of studies reporting short-term immune response

Study Code	Participant age	N (MenACWY-TT)	N (comparison)	Comparator Vaccine	GMT ratios*	Absolute difference in % seroresponders*^	Interpretation
MET54	12-24 months	94	94	MCV4-TT**	1.25-17.36	0.1-14.0	Descriptive; higher GMTs and % seroresponders with MenACWY-TT
MET51	12-23 months	491	395	MCV4-TT**	0.82-7.59	-0.6-19.7	Non-inferior[&]
MET35	2-9 years	458	460	MenACWY-CRM	1.09-14	7.6-47.4	Non-inferior[&]
MET50	10-17 years	499	500	MenACWY-CRM	1.25-7.53	9.2-24.6	Non-inferior[&]
MET43	10-17 years	1098	300	MenACWY-D	1.64-11.4	9.9-42.3	Non-inferior[&]
MET43	18-55 years	1410	293	MenACWY-D	2.03-6.24	19.6-41.1	Non-inferior[&]
MET44	56+ years	201	100	MPSV4	1.60-2.61	11.2-26.5	Descriptive; higher GMTs and % seroresponders with MenACWY-TT
MET49	56+ years	448	453	MPSV4	1.75-4.07	15.7-31	Non-inferior[&]
MET56^^	15+ years	384	389	MenACWY-D	1.68-4.37	1.8-7.4	Non-inferior[&]

All analyses conducted on per-protocol population

*Range for serogroups A, C, W, Y ^Positive results favor MenACWY-TT **Nimenrix, not licensed in US [&]Non-inferiority demonstrated if lower limit of the 95% confidence interval for the difference in seroresponders was > -10% for all four serogroups ^^Study assessed use of MenACWY-TT vs. MenACWY-D for booster dose

GRADE Certainty of Evidence

Evidence type	Study Design
1	Randomized controlled trials (RCTs) or overwhelming evidence from observational studies
2	RCTs with important limitations, or exceptionally strong evidence from observational studies
3	Observational studies, or RCTs with notable limitations
4	Clinical experience and observations, observational studies with important limitations, or RCTs with several major limitations

Certainty of evidence for short-term immune response – Healthy individuals

Certainty assessment							№ of patients		Results	Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Comparison			
8	Randomized trials	No serious*	No serious	No serious	No serious	None	5083	2984	Noninferior See study specific slides	1	CRITICAL

* Although most trials were not fully double-blinded, outcomes were objective titers and laboratory staff testing the samples were blinded to group assignment of the participants.

Certainty of evidence for short-term immune response –

Individuals with medical conditions that increase meningococcal disease risk

Certainty assessment							№ of patients		Results	Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Comparison			
8	Randomized trials	No serious*	No serious	Very serious^	No serious	None	5083	2984	Noninferior See study specific slides	3	CRITICAL

* Although most trials were not fully double-blinded, outcomes were objective titers and laboratory staff testing the samples were blinded to group assignment of the participants.
^Studies did not include individuals at increased meningococcal disease risk due to underlying medical conditions (complement component deficiency, anatomic or functional asplenia, or HIV)

Summary of studies reporting serious adverse events (SAEs)

Study Code	Participant age	% SAE MenACWY-TT	% SAE Comparator group	N related to vaccine
MET54	12-24 months	1.1	0	0
MET51	12-23 months	0.8	0.7	0
MET57	12-23 months	0.0 - 7.7	0.0 - 3.8*	0
MET35	2-9 years	1.4	0.6	0
MET50	10-17 years	0.8	0.8	0
MET43	10-17 years	0.3	0.9	0
MET43	18-55 years	1.6	0.6	0
MET44	56+ years	0.0	0.0	0
MET49	56+ years	3.3	3.3	0
MET62**	4-5 years	0.0	NA^	0
MET56**	15+ years	1.2	1.0	0

*Comparator group includes other infant/toddler vaccines but no meningococcal vaccine
**Safety and/or immunogenicity evaluated after booster dose
^Randomized trial for persistence after primary dose; no comparison group for safety data after booster

Certainty of evidence for serious adverse events – Healthy individuals

Certainty assessment							№ of patients		Results	Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Comparison			
9	Randomized trials	Serious*	No serious	No serious	No serious	None	6413	3623	No vaccine related SAEs	2	CRITICAL

*Most trials not fully double-blinded and outcome measure criteria are not described (whether SAE is related to vaccine)

Certainty of evidence for serious adverse events –

Individuals with medical conditions that increase meningococcal disease risk

Certainty assessment							№ of patients		Results	Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Comparison			
9	Randomized trials	Serious*	No serious	Very serious^	No serious	None	6413	3623	No vaccine related SAEs	4	CRITICAL

*Most trials not fully double-blinded and outcome measure criteria are not described (whether SAE is related to vaccine)

^Studies did not include individuals at increased meningococcal disease risk due to underlying medical conditions (complement component deficiency, anatomic or functional asplenia, or HIV)

Persistence of immune response

- One study evaluated immune persistence to MenACWY-TT 3 years after vaccination with primary dose of MenACWY-TT or MCV4-TT*
- % seroresponders not reported

Study Code	Participant age	N (MenACWY-TT)	N (MCV4-TT*)	Serogroup	GMT MenACWY-TT	GMT MCV4-TT	GMT Ratio
MET62	4-5 years	40	44	A	12.1	16.5	0.73
				C	106	11.7	9.1
				W	48.5	21.9	2.2
				Y	30.9	17.6	1.8

*Not licensed in the United States

Certainty of evidence for persistence of immune response – Healthy individuals

Certainty assessment							№ of patients		Results	Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Comparison			
1	Randomized trial	Serious*	NA	Serious^	Serious**	None	40	44	Higher GMTs for serogroups C, W, Y; lower for serogroup A	4	IMPORTANT

*Fewer than 50% of participants who received primary dose were evaluated for immune persistence
^Study conducted in Finland in patients vaccinated as toddlers, an age group for which MenACWY-TT is not currently licensed in the United States.
**Small number of participants in each arm

Certainty of evidence for persistence of immune response –

Individuals with medical conditions that increase meningococcal disease risk

Certainty assessment							№ of patients		Results	Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Comparison			
1	Randomized trial	Serious*	NA	Very serious^	Serious**	None	40	44	Higher GMTs for serogroups C, W, Y; lower for serogroup A	4	IMPORTANT

*Fewer than 50% of participants who received primary dose were evaluated for immune persistence

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**Small number of participants in each arm

Immune interference due to coadministration with routine adolescent vaccines

- One study assessed coadministration in 10-17y age group
- Response to quadrivalent HPV vaccine

HPV Type	GMT MenACWY-TT+Tdap+HPV	GMT Tdap+HPV	GMTR*	Interpretation**
6	800	800	1.00	Non-inferior
11	1492	1402	1.06	Non-inferior
16	6002	6395	0.939	Non-inferior
18	1271	1118	1.14	Non-inferior

*Calculated as [GMT (MenACWY-TT+Tdap+HPV)] / [GMT (Tdap+HPV)] **Non-inferiority demonstrated if lower limit of 95% confidence interval of the GMTR is >0.67 for each antigen

Immune interference due to coadministration with routine adolescent vaccines

- Response to Tdap vaccine

Antigen	% with ≥ 1.0 IU/mL ab MenACYW-TT+Tdap+HPV	% with ≥ 1.0 IU/mL ab Tdap+HPV	Absolute % difference	Interpretation*
Tetanus	99.7	99.6	0.1	Non-inferior
Diphtheria	97.8	98.9	-1.1	Non-inferior
Pertussis antigen	**GMC MenACYW-TT+Tdap+HPV**	**GMC Tdap+HPV**	**GMC Ratio**	**Interpretation****
PT	37.5	44.4	0.845	Non-inferior
FHA	180	242	0.746	Did not meet non-inferiority criteria
PRN	200	265	0.753	Did not meet non-inferiority criteria
FIM	339	499	0.679	Did not meet non-inferiority criteria

Abbreviations: Ab=antibody; GMC=geometric mean concentration. *Non-inferiority demonstrated if lower limit of 95% confidence interval of percent difference between groups is > -10%. **Non-inferiority demonstrated if lower limit of 95% confidence interval of the GMTR is >0.67 for each antigen

GMC Ratios for coadministration of MenACWY and Tdap compared to Tdap alone

- 3 of 4 pertussis antigens did not meet criteria for noninferiority in MenACWY-TT coadministration study
- Decreased Tdap immune response demonstrated in previous studies of coadministration with MenACWY vaccines
  - GMT ratios for MenACWY-TT similar when compared to co-administration with currently recommended MenACWY vaccines
- **Clinical significance unknown**

	MenACWY-TT + Tdap + HPV	MenACWY-CRM + Tdap[1]	MenACWY-D + Tdap[2]
PT	0.85	0.78	0.93
FHA	0.75	0.85	0.76
PRN	0.75	0.62	0.63
FIM	0.68	NA	NA

1 Gasparini et al. (2010) "Randomized Trial on the Safety, Tolerability, and Immunogenicity of MenACWY-CRM, an Investigational Quadrivalent Meningococcal Glycoconjugate Vaccine, Administered Concomitantly With a Combined Tetanus, Reduced Diphtheria, and Acellular Pertussis Vaccine in Adolescents and Young Adults"

2 Weston et al. (2011) "Immunogenicity and Reactogenicity of Co-Administered Tetanus-Diphtheria-Acellular Pertussis (Tdap) and Tetravalent Meningococcal Conjugate (MCV4) Vaccines Compared to Their Separate Administration

Certainty of evidence for immune interference due to co-administration with other routine adolescent vaccines – Healthy individuals

Certainty assessment							№ of patients		Results	Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Comparison			
1	Randomized trial	Serious*	NA	No serious	No serious	None	Tdap: 360 HPV: 242	Tdap: 263 HPV: 164	Noninferior for Tetanus, Diphtheria, HPV, Pertussis toxoid antigen Noninferiority not met for Pertussis FHA, PRN, FIM antigens**	2	CRITICAL

*Unexplained reduction in number of participants evaluated for HPV immunogenicity

**The clinical relevance of the diminished responses to the pertussis antigens is unknown. Similar coadministration issues have been observed with other meningococcal vaccines.

Certainty of evidence for immune interference due to co-administration with other routine adolescent vaccines –

Individuals with medical conditions that increase meningococcal disease risk

Certainty assessment							№ of patients		Results	Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Comparison			
1	Randomized trial	Serious*	NA	Very serious^	No serious	None	Tdap: 360 HPV: 242	Tdap: 263 HPV: 164	Noninferior for Tetanus, Diphtheria, HPV, Pertussis toxoid antigen Noninferiority not met for Pertussis FHA, PRN, FIM antigens**	4	CRITICAL

*Unexplained reduction in number of participants evaluated for HPV immunogenicity

** The clinical relevance of the diminished responses to the pertussis antigens is unknown. Similar coadministration issues have been observed with other meningococcal vaccines.

^Studies did not include individuals at increased meningococcal disease risk due to underlying medical conditions (complement component deficiency, anatomic or functional asplenia, or HIV)

Coadministration of MenACWY-TT and PCV13

- Both PCV13 and MenACWY vaccines recommended for individuals with certain medical conditions (e.g. asplenia)

- One study assessed coadministration of MenACWY-TT and PCV13 in toddlers
  - No evidence of immune interference between MenACWY-TT and PCV13

Quality of evidence for outcomes of interest

Type	Outcome	Importance	Included in evidence profile	Certainty for healthy individuals	Certainty for individuals with medical conditions that increase meningococcal disease risk
Benefits	Serogroup A, C, W, or Y meningococcal disease	Critical	No	N/A	N/A
	Short-term immune response	**Critical**	**Yes**	**1**	**3**
	Persistence of immune response	**Important**	**Yes**	**4**	**4**
Harms	**Immune interference due to co-administration with other routine adolescent vaccines**	**Critical**	**Yes**	**2**	**4**
	Serious adverse events	**Critical**	**Yes**	**2**	**4**

Benefits and Harms – Summary

- Work group felt that desirable effects outweigh undesirable effects
- Favors inclusion of MenACWY-TT as an option for meningococcal ACWY vaccination

Values, Acceptability, and Feasibility

- 86.6% vaccination coverage for at least one dose of MenACWY vaccine among adolescents[1] demonstrates that target population values and accepts this intervention and that it is feasible with current vaccination platforms
  - Limited data on uptake among other individuals recommended to receive MenACWY vaccine
- Not expected that values, acceptability, or feasibility would differ for MenACWY-TT

[1]Walker TY, Elam-Evans LD, Yankey D, et al. National, Regional, State, and Selected Local Area Vaccination Coverage Among Adolescents Aged 13–17 Years — United States, 2018. MMWR Morb Mortal Wkly Rep 2019;68:718–723. DOI: http://dx.doi.org/10.15585/mmwr.mm6833a2

Resource Use

- MenACWY-TT cost projected to be within 5% of cost of currently licensed and available MenACWY conjugate vaccines
- Resource allocation will not be substantively affected by inclusion of MenACWY-TT as an option for MenACWY vaccination

Should MenACWY-TT (MenQuadfi) be included as an option for meningococcal ACWY vaccination according to currently recommended dosing and schedules?

Criteria	Question	Work Group Interpretation*
Problem	• Is the problem of public health importance?	Yes
Benefits and Harms	• How substantial are the desirable anticipated effects? • How substantial are the undesirable anticipated effects? • Do the desirable effects outweigh the undesirable effects? • What is the overall certainty of the evidence for the critical outcomes?	Small Minimal Favors intervention Varies (High to very low)
Values and preferences	• Does the target population feel that the desirable effects are large relative to undesirable effects? • Is there important uncertainty about or variability in how much people value the main outcomes?	Yes Probably no important uncertainty or variability
Acceptability	• Is the intervention acceptable to key stakeholders?	Yes
Resource Use	• Is the intervention a reasonable and efficient allocation of resources?	Yes
Feasibility	• Is the intervention feasible to implement?	Yes

*Based on Evidence to Recommendations framework

Balance of Consequences

- Question: Should MenACWY-TT (MenQuadfi) be included as an option for meningococcal ACWY vaccination according to currently recommended dosing and schedules?

Balance of consequences	Undesirable consequences *clearly outweigh* desirable consequences in most settings ☐	Undesirable consequences *probably outweigh* desirable consequences in most settings ☐	The balance between desirable and undesirable consequences *is closely balanced* or *uncertain* ☐	**Desirable consequences *probably outweigh* undesirable consequences in most settings** ☒	Desirable consequences *clearly outweigh* undesirable consequences in most settings ☐

Work Group Interpretation

- There is sufficient information to move forward with a decision

- Work group consensus:
  - **MenACWY-TT (MenQuadfi) should be included as an option for meningococcal ACWY vaccination according to currently recommended dosing and schedules**
    - Use only among individuals aged 2 years and up (licensed age groups)

Off label use of MenACWY vaccines

- 2-dose primary series for the following groups at increased risk:
  - Persons with complement component deficiency
  - Persons with functional or anatomic asplenia (including sickle cell disease)
  - Persons with HIV infection
- Booster doses for persons aged <15 years
- >1 booster dose for persons recommended to receive a booster every 3-5 years
- MenACWY-D and MenACWY-CRM for persons aged >55
  - Not off-label for MenACWY-TT

Implementation of MenACWY-TT as an option for MenACWY vaccination

- Does not represent a change in policy or ACIP recommendations and therefore does not require an ACIP vote
- VFC vote and updated VFC resolution required to include MenACWY-TT as an option in the Vaccines for Children Program

Acknowledgements

- ACIP Meningococcal Vaccines Work Group
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- Susan Hariri
- Jamie Cope
- Sara Oliver

References

Clinical Study Code		ClinicalTrials.gov Identifier
MET54	Vesikari T et al. (2020) "Immunogenicity and Safety of an Investigational Quadrivalent Meningococcal Conjugate Vaccine in Healthy Toddlers." Human Vaccines & Immunotherapeutics. https://doi.org/10.1080/21645515.2020.1733869, https://www.clinicaltrialsregister.eu/ctr-search/trial/2014-004367-20/results	NCT03205358
MET51	Vesikari T et al. (2019) "Immunogenicity and Safety of an Investigational Quadrivalent Meningococcal Conjugate Vaccine in Toddlers 12 to 23 Months of Age." 37th Annual Meeting of the European Society of Pediatric Infectious Diseases (ESPID). https://www.clinicaltrialsregister.eu/ctr-search/trial/2016-000749-30/results	NCT02955797
MET35	Simon M et al. (2019) "Immunogenicity and Safety of an Investigational Quadrivalent Meningococcal Conjugate Vaccine Administered in Healthy Children 2 to 9 Years of Age." ID Week 2019. https://www.clinicaltrialsregister.eu/ctr-search/trial/2018-001471-20/results	NCT03077438
MET56	Áñez G et al. (2020) "Immunogenicity and Safety of a Booster Dose of an Investigational Quadrivalent Meningococcal Conjugate Vaccine in Adolescents and Adults." Human Vaccines & Immunotherapeutics. https://doi.org/10.1080/21645515.2020.1733867, https://www.clinicaltrialsregister.eu/ctr-search/trial/2018-001470-18/results	NCT02752906
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MET44	Kirstein J et al. (2020) "Immunogenicity and Safety of an Investigational Quadrivalent Meningococcal Conjugate Vaccine in Adults 56 Years and Older." Human Vaccines & Immunotherapeutics. https://doi.org/10.1080/21645515.2020.1733868	NCT01732627
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MET50	Chang L et al. (2020) "Immunogenicity and Safety of an Investigational Quadrivalent Meningococcal Conjugate Vaccine in Healthy Adolescents." Vaccine. https://doi.org/10.1016/j.vaccine.2020.03.017, https://www.clinicaltrialsregister.eu/ctr-search/trial/2016-001963-35/results	NCT02199691
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MET62	"Immunogenicity and Safety of an Investigational Quadrivalent Meningococcal Conjugate Vaccine Administered as a Booster Dose in Children Vaccinated 3 Years Earlier as Toddlers." https://www.clinicaltrialsregister.eu/ctr-search/trial/2017-001993-40/results	NCT03476135

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