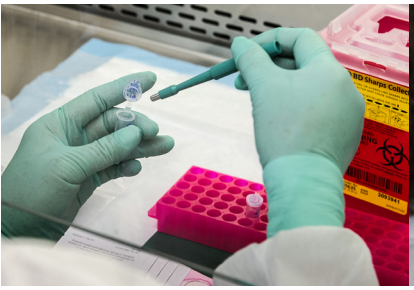
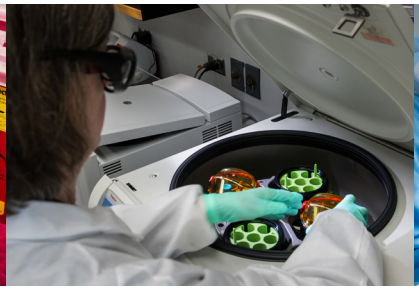
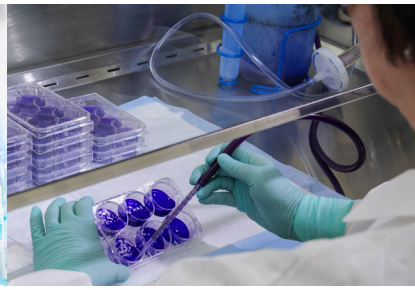
Policies for U.S. Facilities to Transfer Poliovirus Materials

EFFECTIVE MAY 1, 2021



NAC
U.S. NATIONAL AUTHORITY
FOR CONTAINMENT OF POLIOVIRUS

U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

Center for Preparedness and Response

NAC.AUDIT.POL.009.02

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Acronyms

BSC	Biosafety cabinet
CDC	Centers for Disease Control and Prevention
cDNA	Complementary deoxyribonucleic acid
CP	Certificate of Participation
GAPIII	Global Action Plan III
IM	Infectious material
IPV	Inactivated polio vaccine
NAC	National Authority for Containment of Poliovirus
NCC	National Certification Commission
OPV	Oral polio vaccine
PAHO	Pan American Health Organization
PEF	Poliovirus Essential Facility
PI	Principal investigator
PIM	Potentially infectious material
PPE	Personal protective equipment
PV	Poliovirus
RCC	Regional Certification Commission
RMS	*U.S. NAC Risk mitigation strategies for in vitro and in vivo work with poliovirus infectious materials*
RNA	Ribonucleic acid
VDPV	Vaccine-derived poliovirus
WHO	World Health Organization
WPV	Wild poliovirus

Definitions

Circulating VDPV	VDPV isolates for which there is evidence of person-to-person transmission in the community.
Global Action Plan III	The WHO global action plan to minimize poliovirus facility-associated risk after type-specific eradication of wild polioviruses and sequential cessation of OPV use (GAPIII). The 3rd edition of the Global Action Plan (GAPIII) aligns the safe handling and containment of poliovirus infectious and potentially infectious materials with the WHO Endgame Strategy and replaces both the 2009 draft version of the 3rd edition and the 2nd edition of the WHO global action plan for laboratory containment of wild polioviruses.
Inactivated Poliovirus Vaccine	The inactivated poliovirus vaccine was developed in 1955 by Salk and Youngner. IPV is a killed-virus vaccine and is administered by injection.
Infectious material	WPV/VDPV • "Clinical materials from confirmed wild poliovirus (including VDPV) infections; • Environmental sewage or water samples that have tested positive for the presence of wild polioviruses; • Cell culture isolates and reference strains of wild poliovirus; • Seed stocks and infectious materials from IPV production; • Infected animals or samples from such animals, including human poliovirus receptor transgenic mice;

	• Derivatives produced in the laboratory that have capsid sequences from wild polioviruses [1], unless demonstrably proven to be safer than Sabin strains. The safety of new derivatives containing wild poliovirus capsid sequences will be assessed by an expert panel [2], on the basis of comparison to reference Sabin strains for (i) degree and stability of attenuation; (ii) potential for person-to-person transmission; and (iii) neurovirulence in animal models; • "Cells persistently infected with poliovirus strains whose capsid sequences are derived from wild poliovirus [3]." [i] OPV/Sabin • "Cell culture isolates and reference OPV/Sabin strains; • Seed stocks and live virus materials from OPV production; • Environmental sewage or water samples that have tested positive for the presence of OPV/Sabin strains; • Fecal or respiratory secretion samples from recent OPV recipients; • Infected animals or samples from such animals, including poliovirus receptor transgenic mice; • Derivatives produced in the laboratory that have capsid sequences from OPV/Sabin strains [4]; • "Cells persistently infected with poliovirus strains whose capsid sequences are derived from OPV/Sabin strains [5]." [i]
Oral polio vaccine/Sabin	"Attenuated poliovirus strains (approved for use in oral polio vaccines by national regulatory authorities, principally Sabin strains)." [i] Also called 'Sabin vaccine', OPV contains live, attenuated (weakened) poliovirus strains. OPV formulations include: • Trivalent OPV (tOPV) contains all three serotypes of Sabin strains (1 + 2 + 3); use of tOPV ended in April 2016 • Bivalent OPV (bOPV) contains Sabin strains 1 + 3; as of April 2016, only bOPV is used routinely • Monovalent OPV (mOPV) contains only one serotype of Sabin strain
Nucleic acids	Full-length [i] "poliovirus RNA, cDNA and total nucleic acid extracted from poliovirus infectious (*e.g.,* a virus isolate) or potentially infectious materials (*e.g.,* stool, respiratory specimen, sewage) using methods demonstrated to inactivate poliovirus, or synthesized RNA or cDNA (*e.g.,* cDNA clone, synthetic transcript). Poliovirus nucleic acid can be handled outside of poliovirus containment under the condition that these materials will not be introduced into poliovirus permissive cells or animals (as defined in GAPIII and in the "Guidance for non-poliovirus facilities to minimize risk of sample collections potentially infectious for polioviruses") with or without a transfection reagent, except under appropriate containment conditions as described in GAPIII Annex 2 or Annex 3." [ii]

[1] For U.S. facilities, PV derivatives must contain a complete full-length WPV capsid sequence to meet the WPV IM definition.
[2] Expert panel will be determined by WHO.
[3] For U.S. facilities, PV strains must contain a complete full-length WPV capsid sequence to meet the WPV IM definition.
[4] For U.S. facilities, PV derivatives must contain a complete full-length OPV/Sabin capsid sequence to meet the OPV/Sabin IM definition.
[5] For U.S. facilities, PV strains must contain a complete full-length OPV/Sabin capsid sequence to meet the OPV/Sabin IM definition.

	Note: WHO has exempted full-length PV nucleic acids from GAPIII containment. However, WHO does require that full-length PV nucleic acids are included as part of the facility and national inventories.
Poliovirus	A picornavirus consisting of three serotypes: 1, 2 and 3; protective immunity is type-specific. Poliovirus serotypes are further subdivided into wild (circulating in nature) and Sabin strains (attenuated strains used for oral polio vaccines). Poliovirus types 2 and 3 have been eliminated in the wild. In this current stage of polio eradication, only type 1 wild poliovirus continues to circulate in endemic areas. It is highly infectious and causes paralytic polio.
Poliovirus-essential facility	"A facility designated by the ministry of health or another designated national body or authority as serving critical national or international functions that involve the handling and storage of needed poliovirus infectious materials or potentially infectious materials under conditions set out in this [GAPIII] standard." [i] U.S. PEFs will possess or be in pursuit of a CP.
Poliovirus materials	Unless a serotype is specifically identified, PV materials refer to IM and PIM of all three PV serotypes.
Potentially infectious materials	• "Faecal or respiratory secretion samples and their derivatives (e.g. stool suspensions, extracted nucleic acids, etc.) collected for any purpose in a geographic area where WPV/cVDPV is present or OPV is being used at the time of collection; • Products of such materials (above) from PV-permissive cells or experimentally infected polio-susceptible animals; • Uncharacterized enterovirus-like cell culture isolates derived from human specimens from countries known or suspected to have circulating WPV/VDPV or use of OPV at the time of collection; • Respiratory and enteric virus stocks derived from PV PIM and handled under conditions conducive to maintaining the viability or enabling the replication of incidental PV; and • Environmental samples (*i.e.* concentrated sewage, wastewater) collected from areas known or suspected to have circulating WPV/VDPV or use of OPV at the time of collection" [iii]
Vaccine derived poliovirus	Classified with wild polioviruses and usually demonstrate 1–15% sequence differences from the parental OPV strain; they may have circulated in the community (cVDPV) or have replicated for prolonged periods in immunodeficient subjects (iVDPV) or be ambiguous and of unknown origin (aVDPV).

Version History

This is a living document subject to ongoing improvement. Feedback or suggestions for improvement are welcomed. Submit comments directly to the U.S. NAC at: poliocontainment@cdc.gov.

Version	Change Summary	Effective Date
01	New document	09/17/2019
02	Changed facilities covered under this policy to include all U.S. facilities with PV IM and/or PIM materials; material covered to all eradicated and non-eradicated IM, PIM, nucleic acids and inactivated materials of all three PV types. Added guidance for Import Permits and transferring PV materials to and from the U.S.; procedures for intra-entity transfer. Reformatted to include cover sheet, table of contents, and definitions. Clarified risk mitigation issues observed by U.S. NAC auditors during site visits.	05/01/2021

Purpose and Scope

The U.S. NAC located at CDC must report annually all PV eradicated [6] and non-eradicated IM, PIM, and nucleic acids held at U.S. facilities to the U.S. NCC and PAHO RCC [i, iv]. The U.S. NAC *Transfer* policy requires all U.S. facilities that possess PV materials, including eradicated [6] and non-eradicated IM, PIM, nucleic acids and, with the exception of IPV, inactivated materials intended for future experiments, to notify the U.S. NAC of transfers and follow all applicable local, state, federal, and international laws and requirements. Facilities must submit a U.S. NAC Transfer Form to the U.S. NAC after each transfer is complete.

Please note that this U.S. NAC *Transfer* policy (NAC.AUDIT.POL.XXX) supersedes the previously published U.S. NAC *Transfer* policy (NAC.AUDIT.POL.009.01).

Background

The following statements apply to this policy:

- Only U.S. facilities that possess or are in pursuit of a CP issued by the U.S. NAC may be in possession of or receive WPV2/3, VDPV2/3, or OPV2 IM. U.S. facilities using WPV1, VDPV1, and OPV1/3 IM, and all PV PIM should consider developing these procedures.
- The U.S. NAC evaluates WHO GAPIII biosafety and security requirements and guidance and, with the assistance of an external working group and feedback from the affected facilities, creates policies for implementing specific aspects of PV containment in the U.S.
- U.S. NAC policies represent the U.S. NAC interpretation of WHO GAPIII and guidance documents.
- U.S. NAC policies are subject to modification depending on external circumstances such as the epidemiological situation, vaccination coverage, new international policies, or final eradication.
- The U.S. NAC *Transfer* policy was developed for all U.S. facilities and should be shared with any U.S. facility possesses PV materials.
- U.S. NAC policies excerpt information from GAPIII, shown in quotations, and/or includes a reference to GAPIII elements or other materials where applicable.
- The terms: a) “shall” or “must” indicate a requirement; b) “should” or “consider” indicate a recommendation; c) “may” indicates a permission; d) “can” indicates a possibility or a capability.

[6] WHO declared eradication of WPV type 2 in September 2015; eradication of WPV type 3 was declared in October 2019.

Intra- and Inter-Facility Transfers

U.S. facilities must develop procedures to record and control PV material intra- and inter-facility transfers. [*GAPIII subelement 3.3.1*] Prior to shipment, facilities must contact the U.S. NAC when transferring WPV, VDPV, and OPV type 2 IM as well as WPV and VDPV type 3 IM to designated PEFs. [*GAPIII guidance 15.1.1*] All PV material transfers must be authorized by responsible individuals at each facility (*e.g.,* Laboratory Head, PI, Biosafety Officer). [*GAPIII guidance 3.3.1*] All facilities must consider institutional transfer policies and agreements when reviewing PV transfer requests. U.S. NAC approval prior to shipment of any PV material is not required at this time.

Principal investigators at non-PEFs that receive inter- or intra facility transfers of WPV/VDPV1 or OPV1/3 IM must have a U.S. NAC Poliovirus Inventory Survey on file or must submit a survey once the material has been received. Facilities transferring PV materials into or outside the U.S. must contact the U.S. NAC for guidance.

Notifications

U.S. facilities performing inter-facility transfers of PV materials must notify the U.S. NAC by emailing poliocontainment@cdc.gov prior to shipment. The sending facility (PEF or non-PEF) must email the name and location of the receiving facility material type (*e.g.,* WPV type 1 IM) and sample type (*e.g.,* virus isolate), number of samples, expected date of transfer, name and contact information of the individual responsible for receiving the material. U.S. facilities possessing or pursuing a CP must upload a completed U.S. NAC Transfer Form to the U.S. NAC External Partner Site within 5 business days following receipt; facilities that do not have access to the site should email the form (poliocontainment@cdc.gov) within the same time period.

Facilities may perform intra-facility transfers between laboratory and storage area(s) that are managed by the same PI. Facilities can perform intra-facility transfers without notifying the U.S. NAC beforehand. Only PIs approved by the U.S. NAC to possess WPV2/3, VDPV2/3, or OPV2 IM may receive intra-facility transfers of such material. Facilities that possess or are in pursuit of a CP must develop chain-of-custody procedures and documents for intra-facility PV material movements. Intra-facility transfer procedures must ensure the transfer is compliant with institution-specific policies and procedures and the material is packaged according to shipping standards (*e.g.,* U.S. Department of Transportation Category A for PV cultures). Intra-facility transfer procedures must also include appropriate emergency response, biosafety and security measures outlined in the U.S. NAC *Risk mitigation strategies for in vitro and in vivo work with PV infectious materials* to ensure safe and secure transfers. The U.S. NAC recommends that U.S. facilities not pursuing a CP implement similar intra-facility procedures and documents.

If a package is found to be damaged upon receipt such that containment was compromised during shipment or if the shipment is delayed more than 72 hours past the expected delivery time without known cause, the receiving facility must notify the U.S. NAC via email (poliocontainment@cdc.gov) within 12 hours of discovery. In the event of a damaged or lost package, the U.S. NAC will work with appropriate parties (*e.g.,* sender, shipper, and receiver) to determine if an environmental exposure or theft occurred.

Shipping

All PV material must be packaged and shipped in accordance with applicable local, state, federal (*e.g.,* U.S. Department of Transportation Category A for PV cultures), and international shipping laws and requirements. *[GAPIII subelement and guidance 15.1.1]* In addition to notifying the U.S. NAC of a transfer prior to a shipment

and completing the U.S. NAC Transfer form after the transfer is complete, facilities may be required to obtain an Import Permit prior to transferring PV materials into the U.S. Please visit the CDC Import Permit Program website to determine if material to be imported requires an Import Permit.

Facilities must ensure appropriate safety (*e.g.,* PPE, primary containment devices such as a BSC, durable transport containers, disinfectant) and security (*e.g.,* authorized personnel, limit access to laboratory, chain of custody) measures for facility transfers. *[GAPIII subelement 15.1.1]*

Record Management

Facilities possessing or pursuing a CP must maintain documentation of each transfer of PV material for 10 years after withdrawal from the U.S. NAC PV containment program. [*GAPIII subelements 1.4.2, 3.3.1*] Facilities not pursuing a CP should retain records in accordance with their institutional record retention policy. Records include, but are not limited to, transfer forms, shipping invoices, inventory update forms, and email correspondence.

Facility inventory records must be updated, as needed, to account for the removal or addition of the transferred PV material including changes to material types (*e.g.,* WPV type 2 IM), sample types (*e.g.,* nucleic acids), and estimated quantities. All facilities must submit a U.S. NAC Inventory Update Form to the U.S. NAC annually by April 30. U.S. facilities possessing or pursuing a CP must upload a completed U.S. NAC Inventory Update Form to the U.S. NAC External Partner Site while other facilities should email the form (poliocontainment@cdc.gov). Please review the U.S. NAC *Inventory* policy or contact the U.S. NAC at poliocontianment@cdc.gov for additional information.

Attachment

Appendix 1 – GAPIII Poliovirus Transfer Record (NAC.AUDIT.FORM.007.01)

NAC.AUDIT.FORM.00
7.01 NAC Material Tra

References

[i] WHO Global Action Plan III
[ii] WHO Containment Activity Group, Report of the Second Meeting of the Containment Advisory Group, November 2017
[iii] *WHO Guidance to minimize risks for facilities collecting, handling, or storing materials potentially infectious for polioviruses*
[iv] Seventy-first World Health Assembly, May 26 2018