Press Release

Study Demonstrates Benefit of West's ID Adapter for Improving Intradermal Administration of Polio Vaccine

EXTON, Pa., Oct. 10, 2017 /PRNewswire/ -- West Pharmaceutical Services, Inc. (NYSE: WST), a global leader in innovative solutions for injectable drug administration, today shared the results of a study highlighting the benefits of West's ID Adapter for improving the intradermal administration of polio vaccines. The study results were presented at the Fourth Skin Vaccination Summit in May 2017 by Dr. Ondrej Mach, Clinical Trials and Research Team Lead, Polio Department, World Health Organization (WHO), and recently published in the journal *Vaccine.*[i]

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The two-phase field campaign evaluated the feasibility of using fractional inactivated poliovirus vaccine (fIPV) in remote locations where polio outbreaks have persisted. The study demonstrated that fIPV delivered via West's ID Adapter, used in conjunction with a staked needle syringe by Helm Medical GMBH, offers a safe, effective, dose-sparing option for drug delivery.

"We are pleased that our ID Adapter performed so well in this critical research study that addresses a vital medical need," said Karen A. Flynn, Senior Vice President & Chief Commercial Officer, West. "West is proud to offer a solution that can help improve the reliability and performance of intradermal injections while also extending the limited supply of IPV."

Polio (poliomyelitis) is a highly infectious disease that mainly affects children under five years of age. Caused by a virus, polio invades the nervous system and can cause partial to total paralysis in a matter of hours. There is no cure for polio; it can only be prevented through administration of the polio vaccine.[ii] Fortunately, a 20 percent fractional dose of intradermal IPV has been proven just as effective as a full dose of intramuscular inactivated poliovirus vaccine, while allowing significant dose sparing.[iii,iv,v,vi,vii,viii,ix,x] And while intradermal administration has been proven to be a safe, effective method for delivering fractional doses of many vaccines, greater technical skill is required to deliver the dose. West's ID Adapter addresses this problem.

Conducted in Pakistan, where polio outbreaks have persisted, this study sought to evaluate the use of fIPV in conjunction with two types of intradermal devices for outbreak response and routine immunizations of children. The study was led by researchers from Aga Khan University with funding from the WHO and support from the Centers for Disease Control and Prevention (CDC). The study was comprised of two phases:

- Phase 1 assessed the usability and immune response of fIPV administration in children ages 6-12 months with two novel intradermal adapters: one of which was developed by West with a syringe from Helm Medical GMBH.
- Phase 2 evaluated the feasibility of conducting a door-to-door vaccination campaign to administer the fIPV to children under 5 years old.

The study results showed that the immune response achieved with one dose of fIPV administered via the Helm syringe with West's ID Adapter was similar to that achieved by fIPV administered with conventional needle and syringe. The data also demonstrated the safety and usability of intradermal devices in difficult field conditions and showed that fIPV can be used successfully for both primary immunization and as an alternative to full-dose IPV.

For more information about West, visit us online at www.westpharma.com.

About the ID Adapter

West's ID Adapter is a novel injection guide designed for use with 1mL 1/2 inch fixed needle allergy syringes. The ID Adapter can help make intradermal injection easier and more consistent by guiding the angle and limiting the depth of needle insertion. The ID Adapter consists of a sterile, disposable, single-use, injection-molded part that snaps onto a syringe. The ID Adapter provides for consistent ID injections, is convenient and easy to use, and requires minimal end-user training.

About West

West Pharmaceutical Services, Inc. is a leading manufacturer of packaging components and delivery systems for injectable drugs and healthcare products. Working by the side of its customers from concept to patient, West creates products that promote the efficiency, reliability and safety of the world's pharmaceutical drug supply. West is headquartered in Exton, Pennsylvania, and supports its customers from

locations in North and South America, Europe, Asia and Australia. West's 2016 net sales of $1.5 billion reflect the daily use of approximately 112 million of its components and devices, which are designed to improve the delivery of healthcare to patients around the world.

Forward-Looking Statements

Certain forward-looking statements are included in this release. These statements reflect management's current expectations regarding future events and operating performance and speak only as of the date of this release. There is no certainty that West's ID adapter will achieve any level of commercial success. These forward-looking statements involve a number of risks and uncertainties. For a description of certain additional factors that could cause West's future results to differ from those expressed in any such forward-looking statements, see Item 1A, entitled "Risk Factors," in West's Annual Report on Form 10-K for the year ended December 31, 2016. Except as required by law or regulation, we undertake no obligation to publicly update any forward-looking statements, whether as a result of new information, future events, or otherwise.

[i] Saleem AF et al. Needle adapters for intradermal administration of fractional dose of inactivated poliovirus vaccine: Evaluation of immunogenicity and programmatic feasibility in Pakistan. *Vaccine* 2017 May 31; 35(24): 3209–3214. doi: 10.1016/j.vaccine.2017.04.075

[ii] World Health Organization. Poliomyelitis Fact Sheet. April 2017. Retrieved from: http://www.who.int/mediacentre/factsheets/fs114/en/

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[viii] Nelson K.S., Janssen J.M., Troy S.B., Maldonado Y. Intradermal fractional dose inactivated polio vaccine: a review of the literature. *Vaccine*. 2012;30:121–125. doi: 10.1016/j.vaccine.2011.11.018. Epub 2011 Nov 17.

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[x] Resik S., Tejeda A., Sutter R.W. Priming after a fractional dose of inactivated poliovirus vaccine. *N Engl J Med*. 2013;368:416–424. doi: 10.1056/NEJMoa1202541.

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