



**Use of Needle-free Jet Injection Technology Can
Increase Immunization Coverage in Workplace Health
Influenza Clinics - Addressing an Unmet Need for
Workplace Health Influenza Immunizations**

*Tara Miller, MS
Chris Galloway, MD
William E. Gannon Jr., MD*

March 2017

INTRODUCTION

Needle-free Injection System (NFIS) technology has evolved significantly over the last 50 years and has been accepted in many routine immunization settings as a safe and effective vaccine delivery method. PharmaJet has emerged as an industry leader in needle-free technology by committing significant design, development and manufacturing expertise to the development of safe, reliable and cost-effective products.

The Stratis[®] needle-free device provides a similar route of administration, depth and dose as a needle and syringe injection, without the drawbacks of using needles. The spring-powered device delivers the vaccine by means of a precise narrow fluid stream that penetrates the skin in about 1/10th of a second. Furthermore, the Stratis is the only needle-free injection system that is pre-qualified by the World Health Organization (WHO). The Syringes are disposable and auto-disabling, which means they are designed to be used one time, effectively eliminating syringe re-use and the associated spread of infectious disease. This feature fulfills a significant requirement for pre-qualification.

Company hosted flu clinics are an effective way to make getting a flu shot easy and convenient for employees. Therefore, flu shots can be administered to employees at their place of work by trained healthcare professionals as part of workplace health influenza clinics. The benefits of needle-free injection technology in workplace health influenza immunization clinics are significant:

Safe

- No needle, therefore no risk of needle stick
- Auto-disabling syringe which means no reuse
- Accurate and consistent injections
- Reduces sharps disposal which reduces cost and waste
- Delivers vaccines to the desired tissue depth

Fast

- Delivers the vaccine into the muscle in about 1/10 of a second
- Most healthcare providers are self-trained within 20 minutes

Easy

- 95% of patients would choose it again for their next vaccination ⁽¹⁾
- Minimizes injection associated fear and anxiety for the patient and provider resulting in a better experience

The aim of this paper is to evaluate an unmet need for increasing immunization coverage in workplace influenza clinics by offering needle-free injection technology as an alternative to needle and syringe delivery.

BACKGROUND

Influenza is one of the most common preventable⁽²⁾ infectious diseases. In the United States alone, approximately 10-20%⁽³⁾ of the population contracts influenza each year, which accounts for about 226,000 hospitalizations and 36,000 deaths⁽²⁾ annually. While morbidity and mortality affect mostly the young and old,⁽²⁾ all age groups are affected. This includes the more than half of adults aged 20-64 years that are employed,⁽²⁾ and results in about 111 million lost working days⁽⁴⁾ every year.

Workplace health influenza immunization programs are an important factor to consider for addressing decreased productivity, when a simple flu shot could decrease work absenteeism⁽³⁾ and significantly reduce the risk of spread of influenza to others. According to the National Institute for Occupational Safety and Health (NIOSH), the costs associated with sick days and lost productivity are approximately \$7 billion in the U.S. annually.⁽⁴⁾⁽⁷⁾ In spite of the potential benefits of vaccination, one study showed that only about 20% of healthy working age adults between ages 18-49 receive an annual flu shot.⁽⁵⁾

In addition to improving employee productivity and decreasing absenteeism, there are strategies to immunization practices that can influence the success of influenza vaccination programs such as:

- Obtaining upper management and employee buy-in
- Providing incentives to employees for getting vaccinated
- Offering convenient times and locations
- Educating employees about influenza vaccination
- Offering a needle-free option as a safe and effective alternative to needle and syringe

The measures above could increase compliance of influenza vaccination in the workplace. Increased vaccination rates will reduce employee absenteeism, increase productivity and reduce healthcare utilization and expenditures.

DISCUSSION

During the 2016-17 influenza season, the PharmaJet Stratis Needle-free Injection System was utilized in multiple workplace health influenza clinics. Immunizations were administered by either Affiliated Physician's nurses, Sam's Club pharmacists, or Occupational Health nurses employed by a particular company or organization. There were 35 vaccination events, which included employees from BP Oil, Cargill, Denver International Airport, Ernst & Young, Morgan Stanley, Terumo BCT, Tri Net, and Xerox, among others.

Surveys were completed by patients, caregivers, and event coordinators to collect feedback regarding the acceptability and usability of the device, whether it should be an option for next year, the potential to increase influenza immunization coverage at a particular site, as well as information on the event itself. The results of these surveys by audience are summarized below.

Patients

Overall, 1,018 surveys were completed by working individuals 18-64 years of age that received a needle-free flu shot at one of the influenza vaccination events. Figures 1-3 provide detailed results for each of the three key questions regarding satisfaction, likelihood of choosing a needle-free injection next year, and likelihood of recommending a needle-free injection to friends and family.⁽¹⁾ In summary:

- The majority of patients (97%) were satisfied with the needle-free shot⁽¹⁾
- Ninety-five percent (95%) of patients responded that they would choose needle-free again next year⁽¹⁾
- Ninety-five percent (95%) said they were likely to recommend needle-free to friends and family⁽¹⁾

The detailed patient survey results are shown in Figures 1-3.

*How satisfied were you with today's **Needle-free Flu Shot**?*

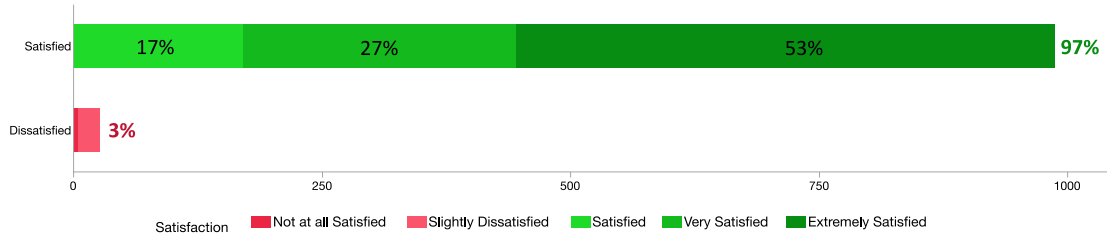


Figure 1: Satisfaction with needle-free injection

*For next year's flu vaccination, will you choose to receive your flu shot with a **Needle-free Injection**?*

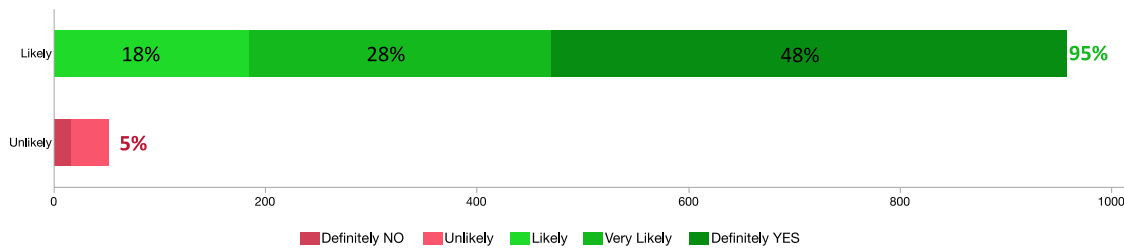


Figure 2: Likelihood of choosing a needle-free injection next year

*How likely are you to recommend a **Needle-free Flu Shot** to your family and friends?*

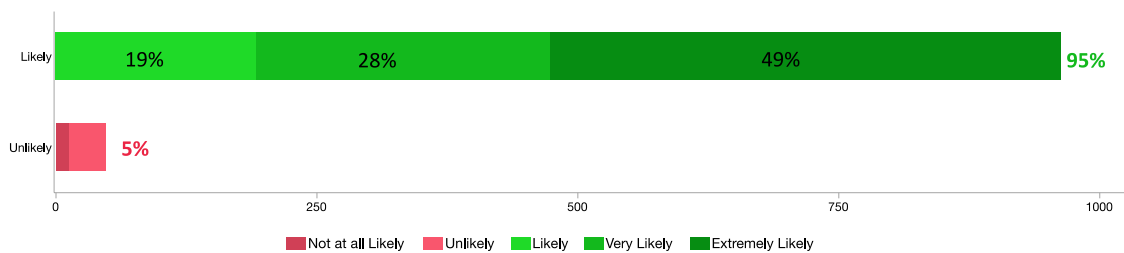


Figure 3: Likelihood of recommending a needle-free injection to family or friends

Healthcare Providers

PharmaJet has been collecting healthcare provider feedback from those administering needle-free vaccinations with the Stratis needle-free injector in retail and workplace health clinics for several years. The providers of needle-free influenza vaccinations have included contract nurses, pharmacists, and occupational health nurses employed full time at some organizations. For the 2016-17 workplace health clinics, six surveys were completed by healthcare providers following flu clinic events. All (100%) of the healthcare providers surveyed were both satisfied with the ease of use of the device and all indicated that they would like to have needle-free delivery as an option in their workplace health clinic next year. ⁽¹⁾ Additionally, 33% thought having a needle-free option would increase immunization coverage in their workplace immunization programs. ⁽¹⁾ Of those that responded to the immunization coverage question, two thirds (67%) answered needle-free could potentially increase immunization rates in their workplace immunization program by greater than 10%. ⁽¹⁾

The 2016-17 workplace health immunization clinic results are consistent with the results obtained in previous flu clinics where the PharmaJet needle-free system was used to give influenza vaccinations. Additionally, healthcare providers that participated in vaccinations during this flu season came from similar backgrounds as the providers that performed influenza vaccinations in previous years.

Healthcare provider results from previous flu clinics are summarized below. There were 67 healthcare providers that completed the survey in total: ⁽⁶⁾

- 91% of healthcare providers were satisfied with Ease of Use ⁽⁶⁾
- 87% would like the option of Needle-free next year ⁽⁶⁾
- 82% said they would be likely to recommend Needle-free flu shots to their colleagues ⁽⁶⁾
- 45% of respondents from previous vaccination events thought that offering a Needle-free option could increase flu vaccinations by more than 10% at their facility ⁽⁶⁾

The detailed healthcare provider survey results are shown in Figures 4 – 7.

*How satisfied were you with the **Ease of Use**?*

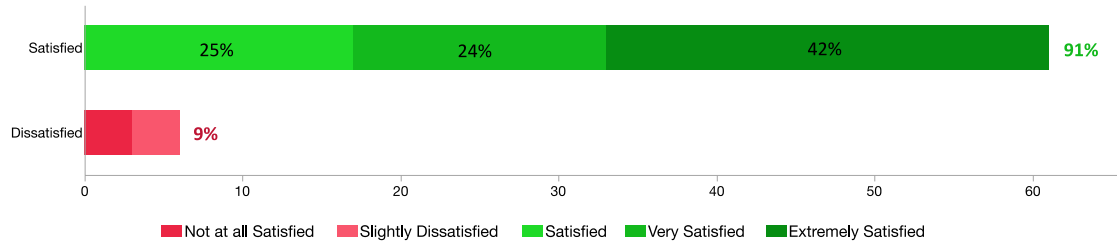


Figure 4: Satisfaction with Ease of Use

*For next year's flu vaccinations, would you like the option of **Needle-free Shots** at your facility?*

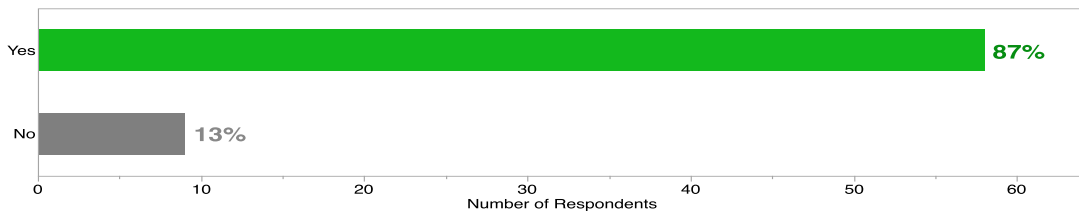


Figure 5: Needle-free option for next year

*How likely are you to recommend **Needle-free Flu Shots** to your colleagues?*

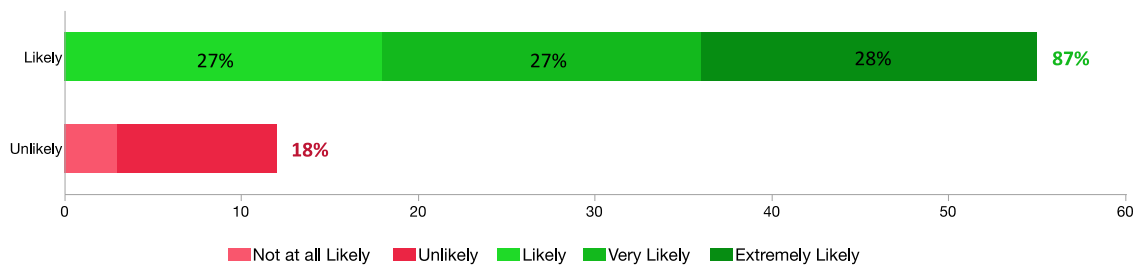


Figure 6: Likelihood to recommend to colleagues

*How much could your flu vaccinations increase next year by offering the option of a
Needle-free Flu Shot?*

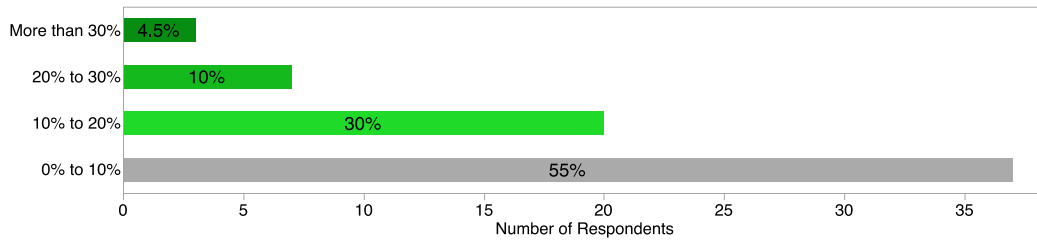


Figure 7: How much could vaccination increase by offering Needle-free

Event Coordinators

Event coordinators completed surveys regarding their overall experience with the workplace health immunization event, and the potential for increasing immunization coverage for their site. Overall, 91% thought the event met the expectations ⁽¹⁾ for their location and 73% responded they would like to participate in an event again next year. ⁽¹⁾ Additionally, several respondents said that including a needle-free delivery option had the potential to increase influenza vaccinations in their workplace health program by greater than 10% next year. ⁽¹⁾

CONCLUSION

There are approximately 216.5 million ⁽²⁾ healthy working adults in the US that are between 20-64 ⁽²⁾ years of age. However, only about 20% that are 18-49 years of age receive an annual influenza immunization. ⁽⁵⁾ This is a small percentage of individuals of working age that receive a flu shot each year. Based on the numbers of sick days and lost productivity reported annually, it is clear there is an unmet need for increasing vaccination rates in the workplace. Offering needle-free technology in a workplace influenza immunization program has the potential to help meet this need and could be beneficial to the overall health of the employees and the productivity of the organization.

Refer to Instructions for Use to ensure safe injections and to review risks.

For more information, contact: info@pharmajet.com

Bibliography

1. Doc. # 61-10294 Third Party Review Influenza Clinic Surveys. Internal. PharmaJet, Inc; 2017.
2. Norwalk M.P., et al. Improving Influenza Vaccination Rates in the Workplace. American Journal of Preventive Medicine. 2010; 38.
3. Strunk C. Innovative Workplace Influenza Program Boosting Employee Immunization Rates. AAOHN Journal. 2005 53; 10.
4. Centers for Disease Control and Prevention; 2016 [cited 2016 October. Available from: <http://www.cdc.gov/flu/about/season/flu-season-2016-2017.htm>.
5. Lee B.Y., et al. Economics of employer-sponsored workplace vaccination to prevent pandemic and seasonal influenza. Vaccine. 2010; 28.
6. Doc. #61-10194 Third Party Review - Stratis PMS Health Care Provider. Internal. PharmaJet, Inc.; 2015.
7. NIOSH. Centers for Disease Control and Prevention. [Online]. [cited] 2017. Available from: <https://www.cdc.gov/niosh/topics/flu/surveillance.html>.