Winnipeg Regional Health Authority / Office régional de la santé de Winnipeg Caring for Health / À l'écoute de notre santé **DECISION SUPPORT TOOL**	**Practice Guideline:** **Drawing medications from a glass ampoule and the use of filter needles: Population and Public Health**		
	Approved by: ☒ **Population and Public Health** ☒ **Communicable Disease and Immunization Program**	**Target review date:**	*Pages: 1 of 7*
	Approval Date: Aug 16,2018 **Updated:**	**Supercedes:**	

1. PURPOSE

This document is intended to provide decision support for health care providers in Population and Public Health (PPH) in navigating potential harms from glass shards when drawing medications from glass ampoules and the use of filter needles.

Decision support tools provide guidance for programs and practitioners to make decisions based on a number of clinically relevant factors. In the case of glass ampoules and related glass shards, evidence lacks to definitively inform decisions in all clinical contexts.

2. SCOPE AND GOAL:

This decision support tool applies to health care providers working within PPH, who draw up and/or administer medications in the course of their work. Decisions around the use of filter needles are covered in this document only as they apply to drawing up medications other than vaccines from an ampoule. Filtration needles are not recommended for vaccine products or diluent preparation or administration, according to the National Advisory Committee on Immunization (NACI).

3. DEFINITIONS

Ampoule: a sealed glass capsule containing a liquid measured quantity of a medication or diluent ready for administering, often by injection. The ampoule is opened by breaking the neck. This process can cause a shower of glass shards that may be too small to be seen. Administration of medication with glass shards can result in inflammation of the veins and infection.

Filter Needle: A filter needle has a 5 micron filter at the base of a syringe needle. The filter creates a one-way flow when withdrawing or injecting fluid into or from the syringe. The filter needle can be used either to withdraw or to inject but never for both; it should only be pulled or pushed in one direction. A filter needle will reduce the chance of glass being introduced into a medication.

4. BACKGROUND

PPH recommends the discriminate use of filter needles when drawing medications from an ampoule, based on a number of factors that relate to the risks and benefits to the client receiving the medication.

The harms related to glass shards potentially drawn from medication within ampoules arises as a theoretical concern in the literature, the clinical significance of which is not clear (primarily transient local reactions). The evidence of glass particles and related harms is inconclusive and a number of contextual factors should be considered. Thus the procedural section of this document provides decisional support for health care providers.

5. PROCEDURE: When using medications from glass ampoules the following considerations should be made:

5.1. Opening the ampoule. Using an alcohol swab or ampoule breaker when opening an ampoule will reduce the risk of glass shards entering the ampoule contents (Alberta Health Services, 2013). Ampoule breakers are generally recommended to prevent cuts to the health care provider who is opening the ampoule.

5.2. Deciding on the use of a filter needle: Most of the situations for which filter needles are highly recommended do not generally apply in PPH clinical practice. Appendix A provides an algorithm of the following factors the practitioner should consider in the choice around the use of a filter needle. The evidence of glass particles and related harms is stronger in the following situations for which filter needles are advised:

5.2.1. Ampoules larger than 1 ml: Preston & Hegadoren (2004) found the majority of medications drawn from 1 ml ampoules contained no glass particles. The incidence of particles nearly doubled with medications drawn from 2 ml ampoules (Carbone-Traber, 1985; Lye & Hwang, 2003). Significantly higher particle contamination occurs with ampoules of 10 ml or more (Zabier, Choy, & Rushdan, 2008)**.**

5.2.2. Intravenous administration: Stein (2006) undertook an evidence review on the harms associated with glass shards and recommends the use of filter

needles when drawing medications from ampoules for intravenous administration only. Filter needles have also been highly recommended for medications administered into a central catheter (Heiss-Harris & Verklan, 2005). These situations generally do not apply to PPH.

5.2.3. Repeat exposure: Repeated exposure to glass particles may result in cumulative harms. Preston & Hegadoren (2004) recommend filter needles use for patients who receive ongoing scheduled IM administration. The authors do not recommend filter needles be used for one-time IM administrations.

5.2.4. Needle gauge larger than 21g: Two studies have found that smaller gauge needles (23 g or 21g) significantly reduced the incidence of glass particle aspiration over larger gauge needles (18g) (Preston & Hegadoren, 2004; Zabir et al. 2008). No significant differences were noted in the incidence of aspirated particles between 23g needles and Filter Straw© filter needles.

5.2.5. Patients more vulnerable to glass particle-related harms: Neonates are considered particularly vulnerable to the harms associated with glass shards administered through central catheters (Heiss-Harris & Verklan, 2005).

5.2.6. Context of medication administration/ emergency situations: When rapid administration of medication is indicated, filtering may delay delivery. This applies specifically to the use of filter needles to draw up epinephrine (apparent anaphylaxis) or naloxone (apparent opioid overdose). Delaying the delivery of an emergency medication in either an apparent anaphylactic reaction or opioid overdose in order to take precautions to remove the potential for glass shards is not favourable from a risk/benefit perspective. Both of these medications have relevance to Population and Public Health programming.

5.2.7. Vaccines and biologicals: Filter needles are **not** indicated for drawing up biological products and their respective diluent from glass ampoules. Filter needles could potentially filter out particulate matter such as adjuvants or other active ingredients, making a vaccine less effective.

5.3. Based on the clinical considerations filter needles are NOT recommended by PPH for drawing up epinephrine in a suspected anaphylactic event, or naloxone in a suspected opioid overdose.

5.4. If the above considerations support a decision to use a filter needle, a *Blunt Filter Needle Information* Sheet is available to support proper use http://home.wrha.mb.ca/prog/medquality/files/Filter_Needles_InfoSheet.pdf Filter needles may not be routinely stocked in PPH offices due to the rare indication for their use. If medications are being ordered for administration that is consistent with filter needle recommendations, filter needles and compatible syringes should be ordered.

6. VALIDATION / REFERENCES

Alberta Health Services (2017). *Immunization Standards.* Retrieved from: http://www.albertahealthservices.ca/assets/info/hp/cdc/if-hp-cdc-ipsm-standard-administration-immunization-06-100.pdf

British Columbia Centre for Disease Control (2016). *Immunization standards*. Retrieved from: http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/Epid/CD%20Manual/Chapter%202%20-%20Imms/Appendix_B_Administration.pdf

CCDR • November 2, 2017 • Volume 43-11; New vaccine administration practice recommendations from the Canadian Immunization Guide ; C Jensen1, D Moore2, C Mah3, O Baclic1, S Marchant-Short4 on behalf of the National Committee on Immunization (NACI)

Carbone-Traber K. Glass particle contamination in single-dose ampoules. *Anesth Analg 1986;65*:1361–3.

Heiss-Harris GM, Verklan MT. Maximizing patient safety: filter needle use with glass ampoules*. J Perinat Neonatal Nurs 2005;19*(1):74–81.

Lusardi P. Research corner: myth versus reality: do we need to filter medication ampules? *American Association of Critical-Care Nurses*. 2008;19(4):p. 8

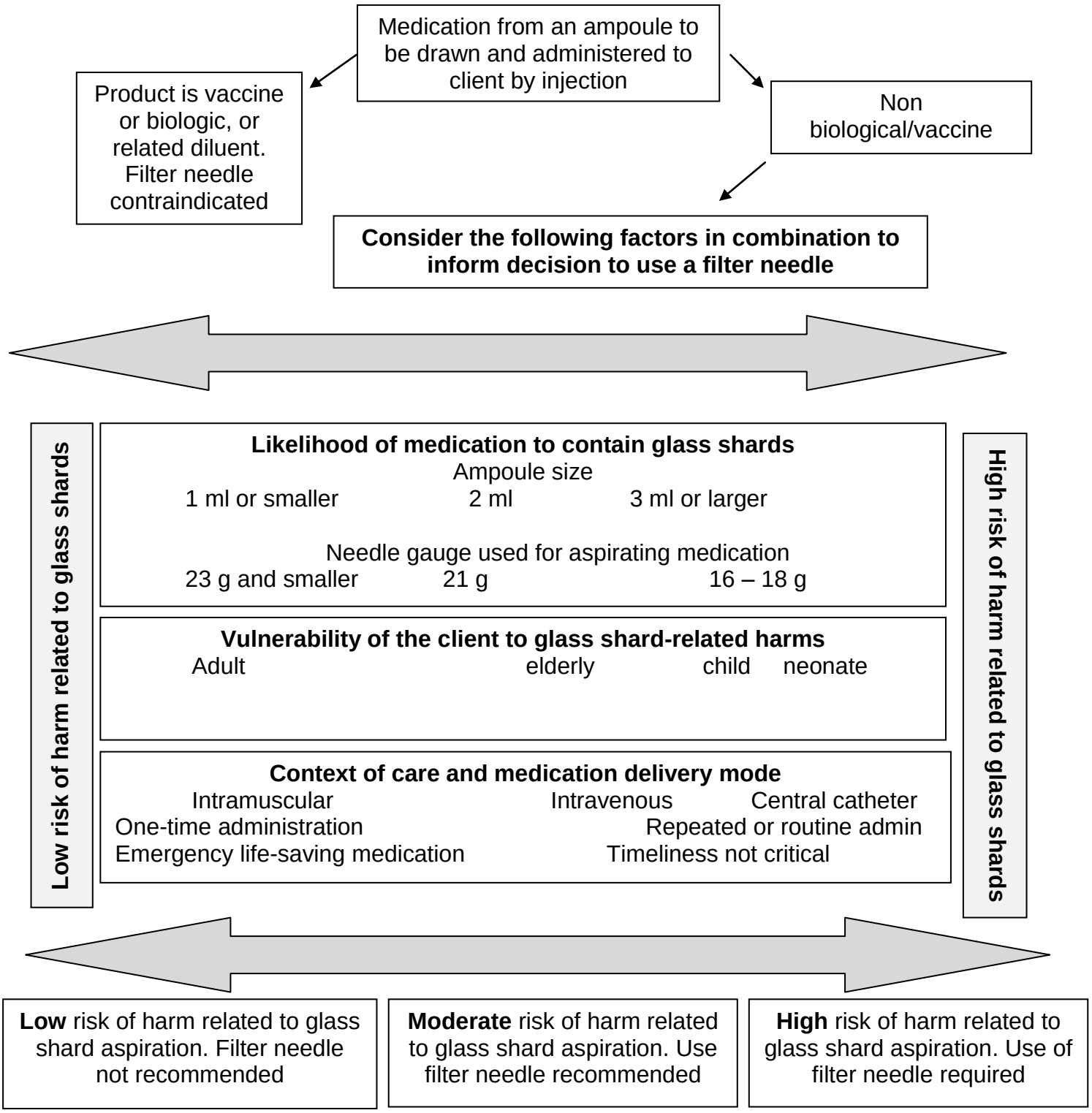
Lye ST, Hwang NC. Glass particle contamination: is it here to stay? Anaesthesia 2003;58(1):93–5.

Preston, S.T. & Hegadoren, K. (2004), Glass Particle Contamination in parenterally administered medication. *Nursing Journal of Advanced Nursing, November 2004, Vol.48*(3), pp.266-270

Stein, H.G. (2006). Glass ampules and filter needles: an example of implementing the sixth 'R' in medication administration. *Medsurg Nursing 15(5).*

Zabir, A.F., Choy C.Y, & Rushdan, R. (2008) Glass particle contamination of parenteral preparation.ns of intravenous drugs in anaesthetic practice, *Southern African Journal of Anaesthesia and Analgesia, 14:*3, 17-19, DOI: 10.1080/22201173.2008.10872550

Appendix A- Decision Support Algorithm



Note: Filter needles are NOT recommended for drawing up epinephrine in a suspected anaphylactic event, or naloxone in a suspected opioid overdose