**EVALUATION OF A NEW CLOSED SYSTEM TRANSFER DEVICE (CSTD)**

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**BACKGROUND**
- Odette Cancer Centre pharmacy had been using a CSTD for selected hazardous drugs (HDs) since 2006 and for all HDs since April, 2014.
- The FDA designated the Equashield® system with the ONB designation as a CSTD that is proven air-tight, leak-proof and prevents ingress of microbial contamination in 2014 and it was first marketed in Canada in mid 2014¹.
- We had recently experienced challenges with our existing CSTD and felt that prior to a competitive bid process we should develop some experience with a new qualified product.
- A recent report compared levels of syringe plunger contamination with cyclophosphamide found with Equashield® syringes and Becton Dickinson® syringes used with PhaSeal® CSTD.

**METHODS**
- We conducted a qualitative evaluation of Equashield® by using the components in our outpatient chemotherapy-pharmacy unit starting in November, 2014.
- Equashield® was evaluated on ease of use by technicians, pharmacists and nurses.
- Pharmacy staff training was conducted by the Pharmacy department trainer in 45 minute sessions with 2-3 personnel per session.
- 14 technicians and 13 pharmacists were trained over 2 days immediately prior to implementation.
- Nurses were trained in 15 minute group sessions by an Equashield® representative.
- All staff using Equashield® completed a questionnaire that asked them to rate Equashield® from an ease of use perspective for specific tasks.
- We documented the occurrence of coring or appearance of particulates in vials of drugs or in prepared solutions.

**Equashield® Components & Manipulations**

1. Syringe unit
2. Spike Adapter 20/2
3. Spike Adapter 30c/2
4. Spike Adapter 13/2
5. Female Connector (FC-1)
6. Spike Adapter IT (SA-IT)
7. Spike Adapter W (SA-W)
8. Luer Lock Connector (LL-1)
9. Female Connector (FC-1) (SA-W for diluent only)
10. Protective Plug (PP-1)

- When withdrawing from a cyclophosphamide bag, rather than a vial.
- E.g. withdrawing a protective plug on a Syringe unit.
- When inserting a Female Connector (FC-1) on a Syringe unit.
- Luer Lock connectors allow HD to be added to Infusers.

**REFERENCES**

**RESULTS**

**Rated Easier than Previous CSTD**
- Attachment of vial adapter to vial
- Attachment of syringe to vial adapter
- Withdrawal of drug from vial, including viscous and cold drug
- Reconstitution of a drug
- Injection of drug into infusion bag via bag adapter
- Syringe to syringe transfers
- Attachment of connectors to Equashield® injectors
- De-bubbling an infusion bag through a bag adapter
- Storage of vials with adapters attached
- Insertion of bag adapter into infusion bag slightly easier

**No Difference from Previous CSTD**
- Withdrawal of drug from a cyclophosphamide stock bag or IV base bag
- Insertion of spike into NON-DEHP or empty viasflex bag
- Injection of drug into an elastomer pump bottle via luer lock connector
- Insertion of primed CADD administration set into an infusion bag adapter
- Removal of Equashield® components from sterile packaging
- Storage of Equashield® components within the BSC
- Swabbing the critical site membrane of the vial adapter

**Advantages**
- Vial adapters attached by hand; no special device is required.
- No pre-priming of vial adapters with air; air exchange occurs within Equashield® syringe unit.
- No blocking or clogging of air exchange passage.
- Larger syringes (35 & 60ml) have 17G drug access needle, making large drug volumes, viscous drugs and cold drugs easy to withdraw.
- Syringe barrel is closed; no risk of contamination or drug spillage due to plunger withdrawal.
- Less wrist strain when drawing up large volume.
- Fewer incidents of coring noted.

**Disadvantages**
- No spinning clutch on female connector.
- Drug filled syringes with large volumes intended for IV push are longer than with previous CSTD.
- 2 versions of bag adapters: one for stock diluents and one for infusion bags of HDs.

**Pharmacist & Nurse Evaluations**
- 71% of ratings (3 criteria) deemed Equashield® similar to previous CSTD in terms of packaging and checking process.
- 56% of nurse ratings (8 criteria) deemed similar, 30% easier and 14% more difficult than previous CSTD.

**DISCUSSION**
- Training was uncomplicated as all staff were already proficient in using a CSTD.
- Equashield® was favourably evaluated by a majority of staff.
- Access through our GPO is being investigated.