

# The Role of Low-Volume IV Tubing for Outpatient Infusions and Clinical Research

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## Significance and Background:

Most FDA-approved chemotherapy and investigational agents for adults are administered using IV bags.

Tubing for IV bags is designed with an inside diameter (ID) large enough to facilitate easy priming and to prevent triggering distal pressure pump alarms.

## Purpose:

Increased priming volume requires more chair time in outpatient infusion settings. Phase I and II studies require accurate infusion start and stop times, particularly for protocols requiring pharmacokinetics.

The infusion duration is influenced by the priming volume of the tubing, and depending on the study, can potentially introduce significant research deviations.

## Interventions:

To remedy these problems, the Seattle Cancer Care Alliance Infusion Department made two significant changes.

First, the primary pump tubing was switched from the standard set to one requiring only **7mL** from pump to patient. This change effectively reduced the primary flush volume by 50%.

Next, a custom secondary set for chemotherapy administration was designed by one of the nurses. The standard 10mL set was replaced by a tubing which:

- **Eliminated the drip chamber**
- **Had a significantly smaller inside diameter**
- **Had a permanently bonded Closed System Transfer Devices on both ends for safety.**

The result was a 30-inch tubing displacing only **1.8mL**, reducing the total volume required to clear primary and secondary lines to only **9mL**.

## Evaluation and Discussion:

These changes reduced the total flush time by 66%. For a chemotherapy bag infusing at 100mL/hr., the flush time decreased from 15 minutes to 5. Prior to this change, the drug would require an infusion rate of 115mL/hr. to complete in 60 minutes, or 69 minutes at the original 100mL/hr. rate. Either of these could result in a study deviation. On average, the decreased flush volume saves the department approximately 1,500 minutes per day.\*

\* based on 100 patients/day at 100mL/hr. and 100 patients at 200mL/hr.

### Flush Volume Comparison

	Original Tubing (mL)	New Tubing (mL)	mL difference
Primary**	15	7	8
Secondary***	10	1.8	8
<b>TOTAL</b>	<b>25</b>	<b>9</b>	<b>16</b>

\*\* Measured from pump to patient.

\*\*\* Measured from bag to pump.

### Flush Time Comparison (for illustration purposes)

	Original Primary + Secondary Tubing (min)	New Primary + Secondary Tubing (min)	Difference (min)
Flush time @100mL/hr.	15	5	10



Custom 1.8mL secondary tubing with Spiros and ChemoLock CSTD.

