

## FILTRATION RECOMMENDATION FOR INTRAVENOUS MEDICATIONS

Drug	Class	Type of Filter		Comment
		Preparation	Administration	
Abatacept ( <i>Orencia</i> <sup>®</sup> )	Immunomodulator	NS 100ML MAX CONC:10MG/ML	Administer with an infusion set and 0.2 to 1.2 micron filter <sup>1</sup> low protein binding filter	BUD 24 HR, REF ONLY Use Silicone-free disposable syringe
Abciximab ( <i>Reopro</i> <sup>®</sup> )	Platelet aggregation inhibitor	0.2 or 5 micron filter <sup>2</sup>	0.2 TO 0.22 micron filter: Upon continuous infusion administration <sup>2</sup>	
Ado-Trastuzumab ( <i>Kadcyla</i> )	HER 2-targeted antibody-drug conjugate	NS 250ml	0.2 to 0.22 micron filter (3)	BUD 24 HR, REF
Agalsidase beta ( <i>Fabrazyme</i> )	Enzyme	NS;Refer table 1 package insert for dilution	0.2 micron in-line filter(4)	Do not use filter needles during preparation of infusion; filter prior to administration
Alglucosidase ( <i>Myozyme</i> )	Enzyme	NS CONC: 0.5 to 4mg/ml	0.2 micron in-line filter(5)	Reconstitute vial <i>SLOWLY</i>
Albumin ( <i>AlbuRx</i> <sup>®</sup> or <i>Albuminar</i> <sup>®</sup> )	Human protein	n/a	None for <i>AlbuRx</i> <sup>®</sup> or <i>Albuminar</i> <sup>®</sup> (CSL manufacturer)  <i>see comments</i>	CSL Behring recommends the administration of its products only as directed in the approved product labeling. A filter is not required for the administration of albumin. CSL Behring has not conducted clinical studies with <i>AlbuRx</i> <sup>®</sup> or <i>Albuminar</i> <sup>®</sup> administered using an IV infusion set containing a filter or with an in-line filter.
( <i>Buminate</i> <sup>®</sup> )			( <i>Buminate</i> <sup>®</sup> ) <i>see comments</i>	Follow directions for use printed on the administration set container and product. Make certain that the administration set contains an adequate filter (15-micron or smaller). <sup>6</sup>
Amiodarone ( <i>Nexterone</i> <sup>®</sup> )	Antiarrhythmic agent	n/a	0.22 micron in-line filter <sup>4,5</sup> ( <i>see comments</i> )	Data on file with manufacturer of Nexterone suggests no loss of potency with use of a 0.2 micron in-line filter with the 1.8 mg/mL concentration; other sources suggest no significant loss of drug potency with the use of a 0.22 micron cellulose ester membrane filter ( <i>Ivex-HP, Millipore</i> ). <sup>8</sup>
Amphotericin B	Antifungal agent	n/a	<i>see comments</i>	May administer thorough 1 micron or larger in-line filter. <sup>10</sup>
Amphotericin B liposomal ( <i>Ambisome</i> <sup>®</sup> )	Antifungal agent	Dilute product with 5 micron filter needle provided by the manufacturer <sup>8</sup>	<i>see comments</i>	May administer through 1 micron or larger in-line filter. <sup>12</sup>
Amphotericin B lipid complex ( <i>Abelcet</i> <sup>®</sup> )	Antifungal agent	Use 5 micron filter needle provided by manufacturer <sup>10</sup> ( <i>see comments</i> )	n/a	Do not use an in-line filter. Each filter needle may be used to filter the contents of up to four 100 mg vials. <sup>13</sup>
Anti-thymocyte globulin, equine ( <i>Atgam</i> <sup>®</sup> )	Immune globulin	n/a	0.22 to 1 micron in-line filter <sup>14</sup>	Slight granular or flaky deposits may develop during storage
Anti-thymocyte globulin, rabbit ( <i>Thymoglobulin</i> <sup>®</sup> )	Immune globulin	n/a	0.22 micron in-line filter <sup>15</sup>	
Asparaginase ( <i>Erwinase</i> )	Antineoplastic agent	IV :NS 100ml	5 micron in-line filter <sup>16</sup>	BUD : IV is 4 HRS ;Loss of potency with a 0.2 micron filter. <sup>5</sup>

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		IM: Max Vol 2ml		Gelatinous fibers may develop on standing
Busulfan	Bifunctional alkylating agent	NS or D5W Dilution refer to package insert	5 micron	Do not use polycarbonate syringes or polycarbonate filter needles with busulfan; use only 5 micron nylon filter needle;
Cabazitaxel ( <i>Jevtana</i> ®)	Antineoplastic agent	NS or D5W CONC: 0.1 to 0.26mg/ml	0.22 micron filter <sup>17</sup>	BUD:24 HR, REF
Cetuximab ( <i>Erbixux</i> ®)	Antineoplastic agent	n/a	0.22 micron in-line filter <sup>18</sup>	BUD:12 HR;REF
Cladribine ( <i>Leustatin</i> ®)	Antineoplastic agent	0.22 micron filter (see comments)	n/a	When preparing the 7-day infusion solution, both cladribine and the diluent should be passed through a sterile disposable hydrophilic syringe filter as each solution is being introduced into the infusion reservoir. <sup>19</sup>
Clofarabine ( <i>Clolar</i> ®)	Antineoplastic agent	D5W or NS CONC: 0.15 to 0.4mg/ml	0.2 micron filter	Filter prior to dilution. <sup>20</sup>
Cytomegalovirus immune globulin IV, human ( <i>CytoGam</i> ®)	Immune globulin	n/a	0.22 micron in-line filter (see comment)	0.2 or 15 micron filter is acceptable. <sup>21</sup>
Daratumumab ( <i>Darzalex</i> )	Immunoglobulin G1 kappa human monoclonal antibody	NS:1 <sup>st</sup> infusion =1000ml NS 2 <sup>nd</sup> infusion = 500ml	0.2 to 0.22 micron in-line filter Low protein binding polyethersulfone(22)	
Elotuzumab ( <i>Empliciti</i> )	Humanized recombinant monoclonal antibody directed to SLAMF3	NS or D5W 250ml	0.2 to 1.2 micron filter	BUD :24 HR;REF Protect from light
Epoprostenol ( <i>Flolan</i> ®)	Vasodilator	n/a	0.22 micron in-line filter	An in-line filter was used during clinical trials. <sup>24</sup>
Etoposide	Antineoplastic agent	NS MAX CONC: 4mg/ml	0.22 micron in-line filter PAClitaxel Tubing <b>NON-DEHP</b>	Etoposide solutions of 0.2 mg/mL may be filtered through a 0.22 micron cellulose ester membrane filter (Ivex-HP, Millipore) without significant loss of drug. <sup>6</sup>
<b>Factor VIII Products:</b>				
<i>Human</i>				
Antihemophilic factor/vonWillebrand factor complex ( <i>Humate-P</i> ®)	Antihemophilic agents	Use filter for withdrawal from the vial. Use either the Mix2Vial® filter transfer set provided by manufacturer or a commercially available double-ended needle and vented filter spike <sup>26</sup>	n/a	
<i>Monoclalte-P</i> ®		Use filter needle provided by manufacturer <sup>27,28</sup>	n/a	
<i>Koate</i> ®-DVI				
<i>Recombinant</i>				

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<i>Helixate® FS</i> <i>Recombinate®</i>		Use filter needle provided by manufacturer <sup>29,30</sup>	n/a	
<i>Feiba NF®</i>	Anti-factor VIII Inhibitor	Use filter needle provided by manufacturer <sup>31</sup>	n/a	
Factor IX products: <i>Human</i>	Antihemophilic agents			
Factor IX Complex <i>(Profilnine SD®)</i>		Use filter needle provided by manufacturer <sup>32</sup>	n/a	
<i>Recombinant</i>				
<i>BeneFIX®</i>		Use filter needle provided by manufacturer <sup>33</sup>	n/a	
<i>Gemtuzumab (Mylotarg)</i>	Monoclonal antibody	NS CONC:0.075 to 0.234mg/ml	1.2 micron terminal filter(34)	Protect from light; Do not shake
<i>Hemin (Panhematin)</i>	Hemin agent	Follow package insert regarding dilution and preparation (35)	0.45 micron or smaller terminal filter	BUD: 1 Hr
<i>Ibritumomab tiuxetan (Zevalin®)</i>	Radioimmunotherapeutic monoclonal antibody	n/a	0.22 micron in-line filter	Use in-line filter between syringe and infusion port prior to injection of each component. <sup>36</sup>
<i>Infliximab (Remicade®)</i>	Monoclonal antibody	NS 250ml CONC:0.4 to 4mg/ml	Administer with an infusion set and 1.2 micron or smaller in-line filter <sup>37</sup>	
<i>Ipilimumab (Yervoy®)</i>	Antineoplastic agent	NS or D5W CONC:1 to 2mg/ml	0.2 to 1.2 micron in-line filter <sup>38,39</sup>	BUD: 24 HR; REF
<i>Ixabepilone (Ixempra Kit®)</i>	Antineoplastic agent	n/a	0.2 to 1.2 micron in-line filter <sup>40</sup>	
<i>Lipid emulsion (Intralipid®)</i>	Nutritional product	n/a	1.2 micron or larger	Filters < 1.2 micron pore size must not be use with Intralipid 20%. <sup>41</sup>
<i>Mannitol (Osmitol®)</i>	Osmotic diuretic	5 micron filter needle	0.22 micron in-line filter <i>(see comment)</i>	Recommend using a 5 micron filter needle with the 25% diluted mannitol during preparation and a 0.22 micron in-line filter during administration for all mannitol parenteral solutions.
<i>Nivolumab (Opdivo)</i>	Human monoclonal antibody	NS CONC:1 to 10mg/ml	0.2 to 1.2 micron filter	BUD: 24 HR; REF
<i>Paclitaxel (Taxol®)</i>	Antineoplastic agent	NS or D5W CONC: 0.3 to 1.2 mg/ml	0.22 micron or smaller in-line filter PAClitaxel tubing <b>NON-DEHP(43)</b>	BUD: 24 HR; Room Temp
<i>Paclitaxel albumin-bound (Abraxane®)</i>	Antineoplastic agent	n/a	<i>See comments</i>	Use of a filter is not recommended for Abraxane. <sup>44</sup>
<i>Panitumumab (Vectibix®)</i>	Antineoplastic agent	NS 100 to 150ml Max CONC : 10mg/ml	0.2 to 0.22 micron in-line filter <sup>46</sup>	BUD: 24 HR; REF

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Pembrolizumab ( <i>Keytruda</i> )	Human monoclonal antibody	NS or D5W CONC: 1 to 10mg/ml	0.2 to 5 micron in- line filter (45)	BUD: 24 HR; REF
Phenytoin sodium	Anticonvulsant	n/a	0.22 to 0.55 micron in-line filter (see comment)	Although not recommended by the manufacturer, some studies indicate that an IV infusion of phenytoin may be feasible if proper precautions are observed, such as a suitable vehicle (eg, 0.9% sodium chloride or Ringer’s lactated injection), appropriate concentration, preparing the infusion shortly before administration, and using an in-line filter <sup>7,38</sup> ; according to most studies, a 0.22 micron in-line filter is required; phenytoin sodium (250 mg/5mL in a 5 mL syringe) was filtered at a rate of 1 mL/min through a 5 micron stainless steel depth filter without significant reduction in potency. <sup>47</sup>
Prothrombin Complex Concentrate, Human ( <i>Kcentra</i> ®)	Hemostatic agent	Use filter needle provided by manufacturer <sup>48</sup>	n/a	
Ramucirumab ( <i>Cyramza</i> )	Vascular Endothelial growth factor receptor 2 antagonist	NS 250ml	0.22 micron filter(49)	BUD: 24 HR; REF
Ranibizumab ( <i>Lucentis</i> ®)	Vascular endothelial growth factor antagonist	5 micron filter (see comment)	n/a	Withdraw the solution from the vial through a 5-micron, 19-gauge filter needle attached to a 1 mL tuberculin syringe. Discard filter needle and use a non-filter needle for intravitreal injection. <sup>52</sup>
Solution from glass ampul	n/a	5 micron filter	n/a	
SMOF Lipids 20%	Nutritional Product	1.2 micron filter	Administer w/ 1.2 micron filter	<b>NON-DEHP TUBING SET AND BAG</b>
Siltuximab ( <i>Sylvant</i> )	Human-mouse chimeric monoclonal antibody	D5W 250ml	0.2 micron in-line filter (51)	BUD: 4 HRS
Temsirolimus ( <i>Torisel</i> ®)	Antineoplastic agent	n/a	0.2 to 5 micron in-line filter (see comment)	Administer with in-line polyethersulfone filter (≤ 5 micron) or an endset polyethersulfone filter (0.2 to 5 micron). Do not use both an in-line and endset filter. <sup>53</sup>
Thiotepa	Antineoplastic agent	NS CONC:0.5 to 1mg/ml	0.22 micron filter	Filter prior to administration; polysulfone membrane (Gelman’s Sterile Aerodisc, Single Use) or triton-free mixed ester of cellulose/PVC (Millipore’s MILLEX-GS Filter Unit) are recommended by the manufacturer <sup>42</sup> ; solutions of 10 to 300 mcg/mL did not adsorb to cellulose nitrite/cellulose acetate ester filters (Millipore’s MILLEX-OR) or Teflon filters (Millipore’s MILLEX-FG). <sup>54</sup>
Total Parental Nutrition (TPN)	Nutritional product	n/a		
Without Lipids			0.22 micron in-line filter	
With Lipids			1.2 micron in-line filter	
Ziv-Aflibercept ( <i>Zaltrap</i> ®)	Antineoplastic agent	n/a	0.2 micron filter <sup>55</sup>	