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**LAL
UPDATE®**

Volume 9, No. 4**December 1991**

Dear LAL Users,

In this LAL UPDATE, Associates of Cape Cod announces the recent signing of an agreement with Seikagaku Corporation of Japan for distribution and exchange of technologies. This is an exciting move and will lead to the production of a chromogenic LAL reagent by Associates of Cape Cod.

In addition to this news, we list the products in the 5th supplement to USP XXII for which the Bacterial Endotoxins Test is now the official test. In many cases the LAL Test replaces the rabbit Pyrogen Test. We also list the proposed monograph changes from the Pyrogen Test to the BET given in recent issues of Pharmacopeial Forum. I urge medical device manufacturers to pay particular attention to the proposed medical devices chapter (formerly titled Transfusion and Infusion Assemblies) in the Pharmaceutical Previews section of the November/December issue of PF.

I, along with all the staff at Associates of Cape Cod, wish you a Happy and Prosperous New Year.

Sincerely,



*Thomas J. Novitsky, Ph.D.
Editor*

Associates of Cape Cod and Seikagaku Corporation Enter into Agreement

Associates of Cape Cod, Inc. has licensed from Seikagaku Corporation, Tokyo, Japan, patent rights and technology for the manufacture, distribution, and sale of a chromogenic *Limulus* amoebocyte lysate (LAL) reagent. Associates of Cape Cod will market chromogenic LAL directly to its customers in the US, Canada and Puerto Rico, and through its distributors in Europe and the rest of the world. Seikagaku will continue to market its LAL products, Toxicolor® and Endospey®, in addition to Associates of Cape Cod's gel-clot and kinetic turbidimetric Pyrotell® products (including the LAL-5000) in Japan. The companies have also initiated a joint research program for the development of new and improved technologies in the areas of endotoxin detection, endotoxin removal and sepsis treatment.

Seikagaku Corporation was founded in 1947 and was the first company to develop and market a chromogenic LAL test. With this agreement, Associates of Cape Cod and Seikagaku Corporation will be the only companies to offer all existing LAL methodologies. □

USP Changes to *Bacterial Endotoxin Test* from *Pyrogen Test* for Articles in the 5th Supplement to USP XXII

Because of the large number of changes from the *Pyrogen Test* to the *Bacterial Endotoxins Test* in the Supplement 5 USP XXII, the changes are summarized in tabular form. Only the first article is given in its entirety. Articles are grouped according to whether the endotoxin limit is expressed in EU/mg, EU/mL or EU/USP unit.

“Acetic Acid Irrigation — **Bacterial endotoxins** — When tested as directed under *Bacterial Endotoxins Test* <85>, it contains not more than 0.5 Endotoxin Unit per mL.”

Article	Limit (USP Endotoxin Unit(s) per mg)
Sterile Amdinocillin	0.5
Amikacin Sulfate Injection	0.33
Sterile Amoxicillin	0.25
Sterile Amoxicillin for Suspension	0.25
Sterile Ampicillin	0.15
Sterile Ampicillin for Suspension	0.15
Sterile Ampicillin Sodium	0.15
Sterile Ampicillin Sodium and Sulbactam Sodium	0.17*
Arginine Hydrochloride Injection	0.01
Sterile Azlocillin Sodium	0.07
Aztreonam for Injection	0.17
Sterile Aztreonam	0.17
Betamethasone Sodium Phosphate Injection	29.2
Bumetanide Injection	500
Calcium Gluceptate Injection	0.32
Calcium Gluconate Injection	0.17
Calcium Levulinate Injection	35.70
Sterile Capreomycin Sulfate	0.35
Sterile Carbenicillin Disodium	0.05
Carboprost Tromethamine Injection	714.3
Cefamandole Nafate for Injection	0.15
Sterile Cefamandole Nafate	0.15
Cefamandole Sodium for Injection	0.15
Sterile Cefamandole Sodium	0.15
Cefazolin Sodium Injection	0.15
Sterile Cefazolin Sodium	0.15
Sterile Cefonicid Sodium	0.35
Sterile Cefoperazone Sodium	0.20
Ceforanide for Injection	0.25
Sterile Ceforanide	0.25
Cefotaxime Sodium Injection	0.20
Sterile Cefotaxime Sodium	0.20
Cefoxitin Sodium Injection	0.13
Sterile Cefoxitin Sodium	0.13
Ceftazidime for Injection	0.1
Sterile Ceftazidime	0.1
Ceftizoxime Sodium Injection	0.10
Sterile Ceftizoxime Sodium	0.10
Sterile Ceftriaxone Sodium	0.20
Sterile Cefuroxime Sodium	0.10
Cephalothin Sodium for Injection	1.25
Sterile Cephalothin Sodium	1.25
Sterile Cephapirin Sodium	0.17

Cephadrine for Injection	0.20
Sterile Cephadrine	0.20
Chloramphenicol Injection	0.2
Sterile Chloramphenicol	0.2
Sterile Chloramphenicol Sodium Succinate	0.2
Sterile Chlortetracycline Hydrochloride	1.0
Chromic Chloride Injection	16.70
Clindamycin Phosphate	0.58
Clindamycin Phosphate Injection	0.58
Sterile Clindamycin Phosphate	0.58
Sterile Cloxacillin Sodium	0.40
Sterile Colistimethate Sodium	2.0
Cupric Chloride Injection	250.0
Cupric Sulfate Injection	250.0
Cyclophosphamide for Injection	0.20
Cysteine Hydrochloride Injection	0.7
Sterile Deferoxamine Mesylate	0.33
Diazepam Injection	11.6
Diazoxide Injection	0.5
Sterile Dicloxacillin Sodium	16.70
Dihydrostreptomycin Sulfate Injection	0.5
Sterile Dihydrostreptomycin Sulfate	0.5
Dopamine Hydrochloride Injection	16.67
Dopamine Hydrochloride and Dextrose Injection	16.67
Doxorubicin Hydrochloride Injection	2.2
Doxorubicin Hydrochloride for Injection	2.2
Doxycycline Hyclate for Injection	1.14
Sterile Doxycycline Hyclate	1.14
Dyphylline Injection	0.7
Edetate Calcium Disodium Injection	0.01
Edrophonium Chloride Injection	8.33
Sterile Erythromycin Gluceptate	1.00
Erythromycin Lactobionate for Injection	1.0
Sterile Erythromycin Lactobionate	1.0
Evans Blue Injection	14.0
Furosemide Injection	3.6
Gentamicin Sulfate Injection	1.70
Sterile Hetacillin Potassium	0.30
Sterile Ifosfamide	0.125
Indigotindisulfonate Sodium Injection	5.0
Inulin in Sodium Chloride Injection	0.1
Iopamidol Injection	0.6
Isoxsuprine Hydrochloride Injection	35.70
Kanamycin Sulfate Injection	0.67
Sterile Kanamycin Sulfate	0.67
Lincomycin Hydrochloride	0.5
Lincomycin Hydrochloride Injection	0.5
Sterile Lincomycin Hydrochloride	0.5
Lorazepam Injection	100.0
Manganese Chloride Injection	0.45**
Manganese Sulfate Injection	0.45**
Mannitol in Sodium Chloride Injection	0.04
Methicillin Sodium for Injection	0.10
Sterile Methicillin Sodium	0.10
Metronidazole Injection	0.35
Sterile Mezlocillin Sodium	0.06
Miconazole Injection	0.10
Sterile Minocycline Hydrochloride	1.25

Mitomycin for Injection	10.0
Moxalactam Disodium for Injection	0.05
Nafcillin Sodium for Injection	0.13
Sterile Nafcillin Sodium	0.13
Sterile Neomycin Sulfate	1.30
Netilmicin Sulfate Injection	1.25
Nitroglycerin Injection	0.1**
Oxacillin Sodium for Injection	0.2
Sterile Oxacillin Sodium	0.2
Oxytetracycline Injection	0.4
Sterile Oxytetracycline	0.4
Oxytetracycline Hydrochloride for Injection	0.4
Sterile Oxytetracycline Hydrochloride	0.4
Physostigmine Salicylate Injection	83.4
Phytonadione Injection	14.0
Sterile Piperacillin Sodium	0.07
Plicamycin for Injection	100.0
Sterile Pralidoxime Chloride	0.10
Procainamide Hydrochloride Injection	0.35
Protein Hydrolysate Injection	0.5
Pyridostigmine Bromide Injection	17.0
Rolitetracycline for Injection	1.0
Sterile Rolitetracycline	1.0
Selenious Acid Injection	3.5**
Sisomicin Sulfate Injection	0.5
Sodium Phosphates Injection	1.10
Sterile Spectinomycin Hydrochloride	0.09
Streptomycin Sulfate Injection	0.25
Sterile Streptomycin Sulfate	0.25
Sulfobromophthalein Sodium Injection	1.0
Tetracycline Hydrochloride for Injection	0.5
Sterile Tetracycline Hydrochloride	0.5
Tetracycline Phosphate Complex for Injection	1.0
Sterile Ticarcillin Disodium	0.05
Sterile Ticarcillin Disodium and Clavulanate Potassium	0.07
Tridihexethyl Chloride Injection	1.70
Trimethaphan Camsylate Injection	1.0
Trimethobenzamide Hydrochloride Injection	1.80
Tromethamine for Injection	0.03
Sterile Urea	0.003
Sterile Vancomycin Hydrochloride	0.33
Vidarabine Concentrate for Injection	0.5
Zinc Chloride Injection	25.0
Zinc Sulfate Injection	25.0

*... in a portion equivalent to 1 mg of a mixture of ampicillin and sublactam (0.67 and 0.33 mg, respectively)."
 **USP Endotoxin Unit per µg

Fluorodopa F 18 Injection	175/V
Fructose Injection	0.5
Fructose and Sodium Chloride Injection	0.5
Glycine Irrigation	0.5
Iodipamide Meglumine Injection	3.6
Iothalamate Meglumine Injection	0.9
Iothalamate Meglumine and Iothalamate Sodium Injection	3.35
Iothalamate Sodium Injection	3.35
Iron Sorbitex Injection	10.0
Lactated Ringer's Injection	0.5
Ringer's Irrigation	0.5
Sodium Chloride Injection	***
Bacteriostatic Sodium Chloride Injection	1.0
Sodium Chloride Irrigation	0.5
Invert Sugar Injection	0.5

*** "...it contains not more than 0.5 USP Endotoxin Unit per mL where the labeled amount of sodium chloride in the Injection is between 0.5% and 0.9%, and not more than 3.6 USP Endotoxin Units per mL where the labeled amount of sodium chloride in the Injection is between 3.0% and 24.3%."

Article	Limit (USP Endotoxin Unit(s) per Unit)
Sterile Bacitracin	0.01
Sterile Bleomycin Sulfate	10.0
Dihydroergotamine Mesylate, Heparin Sodium, and Lidocaine Hydrochloride Injection	0.003
Chorionic Gonadotropin	0.03
Chorionic Gonadotropin for Injection	0.03
Hyaluronidase Injection	2.30
Hyaluronidase for Injection	2.30
Sterile Penicillin G Benzathine	0.01
Sterile Penicillin G Benzathine Suspension	0.01
Penicillin G Potassium Injection	0.01
Penicillin G Potassium for Injection	0.01
Sterile Penicillin G Potassium	0.01
Sterile Penicillin G Procaine	0.01
Sterile Penicillin G Procaine, Dihydrostreptomycin Sulfate, Chlorpheniramine Maleate, and Dexamethasone Suspension	0.01
Sterile Penicillin G Procaine, Dihydrostreptomycin Sulfate, and Prednisolone Suspension	0.01
Penicillin G Sodium for Injection	0.01
Sterile Penicillin G Sodium	0.01

Penicillin = per 100 Units

Article	Limit (USP Endotoxin Unit(s) per mL)
Acetic Acid Irrigation	0.5
Anticoagulant Citrate Dextrose Solution	5.56
Anticoagulant Citrate Phosphate Dextrose Solution	5.56
Anticoagulant Citrate Phosphate Dextrose Adenine Solution	5.56
Anticoagulant Heparin Solution	2.5
Anticoagulant Sodium Citrate Solution	5.56
Citric Acid, Magnesium Oxide, and Sodium Carbonate Irrigation	0.5
Dimethyl Sulfoxide Irrigation	0.5

Article	Limit (USP Endotoxin Unit(s) per mEq)
Potassium Acetate Injection	8.80
Potassium Chloride for Injection Concentrate	8.80
Sodium Acetate Injection	3.90
Sodium Bicarbonate Injection	5.0
Sodium Lactate Injection	2.0

Note: "Nafcillin Sodium Injection -retains the Pyrogen Test <151>, the test dose being a volume of undiluted Injection providing the equivalent of 80 mg of nafcillin per kg."

Additional Proposed Changes

A list of 185 articles appears on pages 2073-2075 of the Pharmacopeial Forum, July-August 1991, Vol.17, No.4. Since most of the article specific data appears in the usual USP In-Process Revision format, this supplement will present only a tabular summary of the articles and their limits following the first article which is used as an example. Readers are strongly recommended to consult the original PF reference for articles of particular interest. Readers should also avail themselves of the response policy of the USP and comment on any article they feel has been assigned unreasonable or erroneous limits.

“Sterile Acetazolamide Sodium, USP XXII page 22. The addition of requirements for *Bacterial endotoxins* is proposed at this time for this and 184 other USP articles. This revision activity was initiated with the September-October number of *PF*, pursuant to the announcement under *Bacterial Endotoxins Test* in the Headquarters Column, page 4 of *PF* 16(1) [Jan.-Feb. 1990].

“The proposed endotoxin limits for each article are calculated by the formula K/M , in which K is 5 USP Endotoxin Units per kilogram of body weight for any route of parenteral administration other than intrathecal (for which K is 0.2 USP Endotoxin unit per kg), and M is the maximum human dose of the article in a single hour period per kilogram of body weight, 70 kg being used as the average human weight. Where the same article is utilized in a variety of applications, the use involving the highest dose is used in the calculation of the endotoxin limits. Interested parties are encouraged to submit alternative methods accompanied by supporting data. The *Pyrogen Test* <151> will be considered for those USP articles for which data are submitted to indicate that *Bacterial endotoxins* test cannot be validated.”

The individual proposals for the addition of requirements for *Bacterial endotoxins* appear, by monograph title, under this In-process Revision for the following USP articles. In addition to the 185 articles referred to above, 6 other articles proposing the adoption of the BET are included in the list below.

Article	Limit (USP Endotoxin Unit(s) per mg)
Sterile Acetazolamide Sodium	0.5
Amikacin Sulfate Injection	0.33
Aminohippurate Sodium Injection	0.04
Aminophylline Injection	1.0
Sterile Amobarbital Sodium	0.4
Anileridine Injection	7.2
Ascorbic Acid Injection	1.2
Atropine Sulfate Injection	55.6
Azathioprine Sodium for Injection	1.0
Benzotropine Mesylate Injection	55.6
Sterile Betamethasone Sodium Phosphate and Betamethasone Acetate Suspension	29.2
Bethanechol Chloride Injection	25.0
Biperiden Lactate Injection	83.3
Brompheniramine Maleate Injection	35.7

Bupivacaine in Dextrose Injection	1.8
Bupivacaine and Epinephrine Injection	1.6
Bupivacaine Hydrochloride Injection	2.5
Butorphanol Tartrate Injection	88.0
Caffeine and Sodium Benzoate Injection	0.7
Calcium Chloride Injection	0.2
Carboprost Tromethamine Injection	714.3
Chloroquine Hydrochloride Injection	0.7
Chlorothiazide Sodium for Injection	0.3
Chlorpheniramine Maleate Injection	8.8
Chlorpromazine Hydrochloride Injection	6.9
Codeine Phosphate Injection	5.8
Colchicine Injection	166.7
Desoxycorticosterone Acetate Injection	71.4
Sterile Desoxycorticosterone Pivalate Suspension	2.78
Sterile Dexamethasone Acetate Suspension	21.7
Dexamethasone Sodium Phosphate Injection	31.3
Dibucaine Hydrochloride Injection	35.7
Dicyclomine Hydrochloride Injection	17.2
Diethylstilbestrol Injection	0.7
Diethylstilbestrol Diphosphate Injection	0.7
Digitoxin Injection	111.0
Digoxin Injection	200.0
Dihydroergotamine Mesylate Injection	357.0
Diphenhydramine Hydrochloride Injection	3.4
Doxapram Hydrochloride Injection	3.3
Doxycycline Hyclate for Injection	1.14
Emetine Hydrochloride Injection	5.4
Ephedrine Sulfate Injection	1.7
Epinephrine Injection	357.0
Ergonovine Maleate Injection	0.8
Ergotamine Tartrate Injection	357.0
Sterile Estradiol Suspension	250.0
Estrone Injection	88.0
Sterile Estrone Suspension	88.0
Ethacrynate Sodium for Injection	5.0
Ethylnorepinephrine Hydrochloride Injection	172.4
Fluphenazine Hydrochloride Injection	166.7
Folic Acid Injection	357.1
Gallamine Triethiodide Injection	5.0
Glucagon for Injection	125.0
Glycopyrrolate Injection	555.5
Haloperidol Injection	71.4
Histamine Phosphate Injection	125.0
Hydralazine Hydrochloride Injection	1.45
Sterile Hydrocortisone Suspension	1.25
Hydrocortisone Sodium Phosphate Injection	1.25
Hydrocortisone Sodium Succinate for Injection	1.25
Hydromorphone Hydrochloride Injection	88.0
Hydroxocobalamin Injection	0.4
Hydroxyprogesterone Caproate Injection	0.4
Sterile Hydroxystilbamidine Isethionate	1.1
Hydroxyzine Hydrochloride Injection	3.6
Hyoscyamine Sulfate Injection	714.3
Imipramine Hydrochloride Injection	5.0
Sterile Indocyanine Green	7.1
Iopamidol Injection	0.6
Iophendylate Injection	0.9
Isoniazid Injection	0.3
Isoproterenol Hydrochloride Injection	1250.0
Ketamine Hydrochloride Injection	0.4
Labetalol Hydrochloride Injection	1.2
Leucovorin Calcium Injection	1.79

Lidocaine and Epinephrine Injection	0.7	Propranolol Hydrochloride Injection	55.6
Lidocaine Hydrochloride Injection	1.1	Pyridoxine Hydrochloride Injection	0.4
Sterile Lidocaine Hydrochloride	1.1	Quinidine Gluconate Injection	0.6
Lidocaine Hydrochloride and Dextrose Injection	1.1	Reserpine Injection	71.5
Magnesium Sulfate Injection	0.09	Riboflavin Injection	7.1
Mechlorethamine Hydrochloride for Injection	12.5	Scopolamine Hydrobromide Injection	555.0
Menadiol Sodium Diphosphate Injection	25.0	Secobarbital Sodium Injection	0.9
Menadione Injection	58.3	Sterile Secobarbital Sodium	0.9
Meperidine Hydrochloride Injection	2.4	Sodium Thiosulfate Injection	0.03
Mephentermine Sulfate Injection	7.8	Succinylcholine Chloride Injection	2.0
Mepivacaine Hydrochloride Injection	0.8	Sterile Succinylcholine Chloride	2.0
Mepivacaine Hydrochloride and Levonordefrin Injection	0.8	Sulfadiazine Sodium Injection	0.1
Meprylcaine Hydrochloride and Epinephrine Injection	0.8	Terbutaline Sulfate Injection	1250.0
Mesoridazine Besylate Injection	7.0	Sterile Testolactone Suspension	3.5
Metaraminol Bitartrate Injection	3.5	Sterile Testosterone Suspension	3.5
Methadone Hydrochloride Injection	8.8	Tetracaine Hydrochloride Injection	0.7
Methocarbamol Injection	0.2	Sterile Tetracaine Hydrochloride	0.7
Methohexital Sodium for Injection	0.5	Tetracaine Hydrochloride in Dextrose Injection	1.0
Methotrimeprazine Injection	17.9	Thiamine Hydrochloride Injection	3.5
Methoxamine Hydrochloride Injection	20.0	Thiamylal Sodium for Injection	1.0
Methyldopate Hydrochloride Injection	0.5	Thiethylperazine Malate Injection	35.8
Methylene Blue Injection	2.5 per mL	Thiopental Sodium for Injection	1.0
Methylprednisolone Sodium Succinate for Injection	0.17	Thiothixene Hydrochloride Injection	88.0
Metocurine Iodide Injection	12.5	Thiothixene Hydrochloride for Injection	88.0
Metoprolol Tartrate Injection	25.0	Tobramycin Sulfate	2.00
Morrhuate Sodium Injection	1.4	Tobramycin Sulfate Injection	2.00
Nalorphine Hydrochloride Injection	11.6	Tolazoline Hydrochloride Injection	0.8
Niacin Injection	3.5	Sterile Triamcinolone Acetonide Suspension	4.4
Niacinamide Injection	3.5	Sterile Triamcinolone Diacetate Suspension	7.1
Norepinephrine Injection	83.4	Sterile Triamcinolone Hexacetonide Suspension	17.2
Orphenadrine Citrate Injection	5.8	Trifluoperazine Hydrochloride Injection	172.0
Oxymorphone Hydrochloride Injection	238.1	Triflupromazine Hydrochloride Injection	5.8
Papaverine Hydrochloride Injection	2.9	Tubocurarine Chloride Injection	10.0
Pentazocine Lactate Injection	5.8	Verapamil Injection	16.7
Pentobarbital Sodium Injection	0.8	Sterile Vidarabine	0.5
Perphenazine Injection	35.7	Sterile Vinblastine Sulfate	10.0
Phenobarbital Sodium Injection	0.3	Vincristine Sulfate Injection	62.5
Sterile Phenobarbital Sodium	0.8	Vincristine Sulfate for Injection	62.5
Phentolamine Mesylate for Injection	5.8	Warfarin Sodium for Injection	24.0
Phenylephrine Hydrochloride Injection	25.0		
Phenytoin Sodium Injection	0.3	Article	Limit
Prednisolone Sodium Phosphate Injection	5.0		(USP Endotoxin Unit(s) per Unit)
Prednisolone Sodium Succinate for Injection	5.8	Sterile Bacitracin Zinc	0.01
Sterile Prednisolone Tebutate Suspension	8.8	Corticotropin Injection	3.1
Prilocaine Hydrochloride Injection	0.9	Corticotropin for Injection	3.1
Prilocaine and Epinephrine Injection	0.9	Repository Corticotropin Injection	3.1
Procaine Hydrochloride Injection	0.6	Sterile Corticotropin Zinc Hydroxide Suspension	3.1
Sterile Procaine Hydrochloride	0.6	Cyanocobalamin Injection	0.4 µg
Procaine Hydrochloride and Epinephrine Injection	0.6	Isophane Insulin Suspension	2.5
Procaine and Phenylephrine Hydrochlorides Injection	0.6	Insulin Zinc Suspension	2.5
Procaine and Tetracaine Hydrochlorides and Levonordefrin Injection	0.6	Extended Insulin Zinc Suspension	2.5
Prochlorperazine Edisylate Injection	17.9	Prompt Insulin Zinc Suspension	2.5
Progesterone Injection	3.5	Protamine Zinc Insulin Suspension	2.5
Promazine Hydrochloride Injection	1.8	Oxytocin Injection	35.7
Promethazine Hydrochloride Injection	5.0	Sterile Penicillin G Procaine with Aluminum Stearate Suspension	0.01
Sterile Propantheline Bromide	11.6	Posterior Pituitary Injection	17.0
Propiomazine Hydrochloride Injection	4.6	Methylergonovine Maleate Injection	1.7 µg
Propoxycaine and Procaine Hydrochlorides and Levonordefrin Injection	0.8	Vasopressin Injection	17.0
Propoxycaine and Procaine Hydrochlorides and Norepinephrine Bitartrate Injection	0.8		

The following proposed monographs are included in the In-Process Revision section of Pharmacopeial Forum, Vol. 17, No. 5, Sept.-Oct. 1991. They are presented in tabular summary of the articles and their limits following the first article which is used as an example.

“**Bacterial endotoxins** — When tested as directed under *Bacterial Endotoxins Test* <85>, it contains not more than 2.5 USP Endotoxin Unit per mg of bupivacaine.”

Article	Limit
Bupivacaine Hydrochloride Injection	2.5 mg
Daunorubicin Hydrochloride Injection	5.0 mg
Ephedrine Sulfate Injection	1.7 mg
Morphine Sulfate for Injection Concentrate	3.3 mg
Sufentanil Citrate Injection	6.25 mL
Thiamylal Sodium for Injection	1.0 mg
Technetium Tc 99m Mebrofenin Injection	175V/mL

The following proposed monographs are included in the In-Process Revision section of Pharmacopeial Forum, Vol. 17, No. 6, Nov.-Dec. 1991. They are presented in tabular summary of the articles and their limits following the first article which is used as an example.

“**Bacterial endotoxins** — When tested as directed under *Bacterial Endotoxins Test* <85>, it contains not more than 1.0 USP Endotoxin Unit per mg of azathioprine.”

Article	Limit
Azathioprine Sodium for Injection	1.0 mg
Bupivacaine in Dextrose Injection	1.8 mg
Sterile Cilastatin Sodium	0.23 mg
Doxapram Injection	3.3 mg
Multiple Electrolytes Injection Type 1	0.5 mL
Multiple Electrolytes Injection Type 2	0.5 mL
Sterile Imipenem	0.23 mg
Ringer's and Dextrose Injection	0.5 mL
Tetracaine Hydrochloride in Dextrose Injection	1.0 mg

The following proposed changes are included in the Pharmacopeial Previews section of Pharmacopeial Forum, Vol. 17, No. 6, Nov.-Dec. 1991.

Article	Limit
Dextran 40	1.0 mL
Dextran 40 in Dextrose Injection	1.0 mL
Dextran 40 in Sodium Chloride Injection	1.0 mL
Dextran 70	1.0 mL
Dextran 70 in Dextrose Injection	1.0 mL
Dextran 70 in Sodium Chloride Injection	1.0 mL

- Multiple Electrolytes and Dextrose Injection Type 1 —
“**Pyrogen** — It meets the requirements of the *Pyrogen Test* <151>.”
- Multiple Electrolytes and Dextrose Injection Type 2 —
“**Pyrogen** — It meets the requirements of the *Pyrogen Test* <151>.”
- Multiple Electrolytes and Dextrose Injection Type 3 —
“**Pyrogen** — It meets the requirements of the *Pyrogen Test* <151>.”
- Multiple Electrolytes and Dextrose Injection Type 4 —
“**Pyrogen** — It meets the requirements of the *Pyrogen Test* <151>.”

- Multiple Electrolytes and Invert Sugar Injection Type 1 -
“**Pyrogen** — It meets the requirements of the *Pyrogen Test* <151>. [NOTE — Dilute, with Water for Injection, Injection containing more than 10% of invert sugar to give a concentration of 10% invert sugar.]”
- Multiple Electrolytes and Invert Sugar Injection Type 1 -
“**Pyrogen** — It meets the requirements of the *Pyrogen Test* <151>. [NOTE — Dilute, with Water for Injection, Injection containing more than 10% of invert sugar to give a concentration of 10% invert sugar.]”
- Multiple Electrolytes and Invert Sugar Injection Type 1 -
“**Pyrogen** — It meets the requirements of the *Pyrogen Test* <151>. [NOTE — Dilute, with Water for Injection, Injection containing more than 10% of invert sugar to give a concentration of 10% invert sugar.]”

Medical Devices

The Medical Devices chapter in Pharmacopeial Forum, Vol. 17, No. 6, Nov.-Dec. 1991, (formerly titled Transfusion and Infusion Assemblies) is completely rewritten. The proposed endotoxin limit is 20 EU/device. This is a tenfold increase in stringency over the current limit. Device manufacturers are strongly advised to read this section carefully.

CALENDAR

Center for Professional Advancement Course
“LAL Testing: Drugs, Medical Devices, and Biotechnology-
Endotoxin Detection in QA/QC and
Product Development”
Amsterdam February 5-7, 1992
San Francisco Bay Area, CA March 10-12, 1992
Course Director - Michael E. Dawson, Ph.D.

Semiconductor Pure Water And Chemicals Conference
Santa Clara, CA February 11-13, 1992
“Bacteria and biofilms in ultrapure water-where are they and
how do we find them.” by Marilyn J. Gould, Ph.D.

Keystone Symposia on Molecular and Cellular Biology
“Recognition of Endotoxin in Biologic Systems”
Lake Tahoe, CA March 1-7, 1992

Euromed Bioburden Conference
Steigenberger Hotel
Frankfurt Airport March 23-24, 1992
Methodology - Endotoxin Testing of Medical Devices
Michael E. Dawson, Ph.D.

Parenteral Drug Association Meeting
Wyndham Franklin Plaza Hotel,
Philadelphia, PA March 17-20, 1992
Visit Associates of Cape Cod, Inc. at Booth # 227

92nd American Society for Microbiology
General Meeting
New Orleans May 26-30, 1992