

B

APPENDIX

AGENTS IMPLICATED IN DRUG-INDUCED THROMBOEMBOLIC DISEASES

Drug	Incidence	Level of Evidence ^a
Hemostatic Agents		
Aminocaproic acid	NK	C
Aprotinin	1%	B
Cyanoacrylate	NK	C
Desmopressin	NK	C
Eptifibatide	NK	C
Protamine sulfate	NK	B
Activated prothrombin complex concentrate	NK	B
3-factor prothrombin complex concentrate	0.7%	B
4-factor prothrombin complex concentrate	1.8%	B
Recombinant factor VIIa	7–9.4%	A
Tranexamic acid	NK	C
Anticoagulants		
Heparin	1–5% develop HIT, 25–50% of those develop HITT	B ^a
Low-molecular-weight heparin	2.2%	B ^a
Pentosan	NK	B
Streptokinase	NK	C
Urokinase	NK	C
Warfarin (coumarin derivatives)	NK	B

(continued)

Drug	Incidence	Level of Evidence ^a
Hematopoietic Agents		
Darbepoetin	3.3–8%	A
Erythropoietin	3.3–26.7%	A
G-CSF	NK	B
GM-CSF	NK	B
Estrogen-Containing Agents		
Diethylstilbestrol	6.8–7%	A
Oral contraceptives	6 times the risk of nonusers; 1–2/10,000 woman-year	A
Hormone replacement	0.2–5.9/100 woman-year	A
Antiandrogens		
Cyproterone	5.23 increased odds	B
Flutamide	5%	B ^a
Goserelin	1–5%	B
Leuprolide	16.7%	A
Selective Estrogen-Receptor Modulators		
Raloxifene	9.5/100 woman-year	A
Tamoxifene	3.6–12/100 woman-year	A
Toremifene	1.5%	B
Aromatase Inhibitors		
Anastrozole	1–2.2%	A
Letrozole	NK	C
Androgenic Agents		
Danazol	NK	C
Nandrolone	NK	C
Megestrol	4.9%	B ^a
Follicle-Stimulating Hormone		
Follitropin alfa	NK	C
Antineoplastic Agents		
Aldesleukin	<1%	B
Asparaginase	11–36.7%	A
Basiliximab	3–10%	B

(continued)

Drug	Incidence	Level of Evidence^a
Bevacizumab	4.4–5%	A
Bleomycin	NK	B
Carboplatin	NK	B
Cisplatin	0.67%	B
Dacarbazine	NK	C
Denileukin ¹	11%	B ^a
Docetaxel	8.8%	A
Estramustine	0 ≥20%	A
Etoposide	NK	A
Fluorouracil	NK	B
Gemcitabine		
Imatinib	NK	B
Irinotecan	12.5%	B
Lenalidomide	8%	A
Paclitaxel	NK	B
Ponatinib	NK	A
Ranibizumab	NK	B
Rituximab	NK	B
Sorafenib	NK	B
Thalidomide	3.4–26%	A
Immunologic Agents		
Cyclosporine	NK	B
Dexamethasone	NK	A
Foscarnet	NK	C
Infliximab	NK	B
Immunoglobins	3–3.8%	A
Interferon gamma	NK	B
Interferon alfa-2a	NK	B
Interferon alfa-2b	NK	C
Interferon beta	NK	C

(continued)

Drug	Incidence	Level of Evidence^a
Interleukin-3	NK	C
Methylprednisolone	NK	B
Muromonab	<1%	B ^a
Prednisone	NK	A
Sirolimus	NK	B
Tacrolimus	NK	B
Antipsychotic Agents		
Chlorpromazine	NK	B
Clozapine	1.35%	B
Olanzapine	1.17%	B
Quetiapine	1.35%	B
Risperidone	1.25%	B
Thioridazine	NK	B
Other Psychotropic Agents		
Clomipramine	NK	C
Escitalopram	NK	C
Lithium	NK	C
Contrast Agents		
Iohexol	22.2%	B
Iomeprol	0.8–4.2%	B ^a
Iopamidol	9–22.2%	B ^a
Iothalamate	8–28.6%	B
Ioxaglate	2.7–4.8%	B ^a
Miscellaneous		
Acetohydroxamic acid	NK	B
Botulinin toxin	NK	C
Bromocriptine	NK	C
Calcium gluconate	NK	C
Cocaine	NK	C
Dihydroergotamine	NK	C

(continued)

Drug	Incidence	Level of Evidence ^a
Ecstasy (3,4-Methylenedioxy-methamphetamine; MDMA)	NK	C
Ergotamine	NK	C
Metolazone	NK	C
Papaverine	NK	B
Procainamide	NK	C
Sildenafil	NK	C
Topiramate	6.1%	A
Tretinoin	NK	B

^aDefinitions for Levels of Evidence: Level A—evidence from one or more randomized, controlled clinical trials; Level B—evidence from nonrandomized clinical trials, prospective observational studies, cohort studies, retrospective studies, case-control studies, meta-analyses, and/or postmarketing surveillance studies; and Level C—evidence from one or more published case reports or case series.

G-CSF: granulocyte colony-stimulating factor, GM-CSF: granulocyte/macrophage colony-stimulating factor, HIT: heparin-induced thrombocytopenia, HIT: heparin-induced thrombocytopenia and thrombosis, NK: not known

Source: Garwood CL. Thromboembolic diseases. In: Tisdale JE and Miller DA, eds. *Drug-Induced Diseases: Prevention, Detection, and Management*. 3rd ed. Bethesda, MD: American Society of Health-System Pharmacists; 2018:1064–1066.