**Table 1.1.** American Society of Anesthesiology (ASA) Physical Status Classification, Activity Characteristics/Treatment Risk, and Medical Examples

| ASA Physical Status | Activity Characteristics/Treatment Risk | Medical Examples |
|---|---|---|
| ASA 1<br>A normal healthy patient. | • Patient is able to walk up one flight of stairs or two-level city blocks without distress.<br>• Little of no anxiety.<br>• Little or no risk during treatment. | • Healthy 20-year-old. |
| ASA 2<br>A patient with mild systemic disease. | • Patient has mild to moderate systemic disease or is a healthy ASA 1 patient who demonstrated a more extreme anxiety and fear toward dentistry.<br>• Patient is able to walk up one flight of stairs or two-level city blocks, but will have to stop after completion of the exercise because of distress.<br>• Minimal risk during treatment. | • ASA 1 with respiratory condition, active allergies, dental phobia, or pregnancy.<br>• Well diet or oral hypoglycemic agent—controlled diabetic.<br>• Well-controlled asthmatic.<br>• Well-controlled epileptic.<br>• Well-controlled hypertensive not on medication. |
| ASA 3<br>A patient with severe systemic disease. | • Patient has severe systemic disease that limits activity, but is not incapacitating.<br>• Patient is able to walk up one flight of stairs or two-level city blocks, but will have to stop on the way because of distress.<br>• If dental care is indicated, stress reduction protocol and other treatment modifications are indicated. | • Well-controlled hypertensive on medication.<br>• Well-controlled diabetic on insulin.<br>• Slight chronic obstructive pulmonary disease.<br>• Six or more months ago history of myocardial infarction, cerebrovascular accident, or congestive heart failure. |
| ASA 4<br>A patient with severe systemic disease that is a constant threat to life. | • Patient has severe systemic disease that limits activity and is a constant threat to life.<br>• Patient is unable to walk up one flight of stairs or two-level city blocks. Distress is present even at rest.<br>• Patient poses significant risk during treatment.<br>• Elective dental care should be postponed until such time as the patient's medical condition has improved to at least an ASA 3 classification.<br>• Emergent dental care may be best provided in a hospital setting in consultation with the patient's physician team. | • History of unstable angina, myocardial infarction, or cerebrovascular accident in the last 6 months.<br>• Severe congestive heart failure.<br>• Moderate to severe chronic obstructive pulmonary disease.<br>• Uncontrolled hypertension.<br>• Uncontrolled diabetes.<br>• Uncontrolled epilepsy or seizure disorder. |
| ASA 5<br>A moribund patient who is not expected to survive without the operation. | • Hospitalized patient in critical condition.<br>• Emergency dental care to eliminate acute oral disease is provided only when deemed a component of lifesaving surgery. | • Terminal illness often of acute onset. |
| ASA 6<br>A declared brain-dead patient whose organs are being removed for donor purposes. | • Dental care not warranted. | • Brain-dead. |

**Table 1.2.** Facial, Oral, and Dental Signs Possibly Related to Medical Disease or Therapy

| | Possible Causative Medical Disease or Therapy |
|---|---|
| **Facial signs** | |
| Cachexia | Wasting from cancer, malnutrition, HIV/AIDS |
| Cushingoid facies | Cushing syndrome, steroid use |
| Jaundiced skin/sclera | Liver cirrhosis |
| Malar rash | Systemic lupus erythematosus |
| Ptosis | Myasthenia gravis |
| Taught skin and microstomia | Scleroderma, facial burns |
| Telangiectasias | Liver cirrhosis |
| Weak facial musculature | Neurological disorder, facial nerve palsy, tardive dyskinesia, myasthenia gravis |
| **Oral signs** | |
| Bleeding, ecchymosis, petechiae | Thrombocytopenia, thrombocytopathy, hereditary coagulation disorder, liver cirrhosis, aplastic anemia, leukemia, vitamin deficiency, drug induced |
| Burning mouth/tongue | Anemia, vitamin deficiency, candida infection, salivary hypofunction, primary or secondary neuropathy |
| Dentoalveolar trauma | Interpersonal violence, accidental trauma, seizure disorder, gait/balance instability, alcoholism |
| Drooling | Neoplasm, neurologic–amyotropic lateral sclerosis, Parkinson's disease cerebrovascular accident, cerebral palsy, medications (e.g., tranquilizers, anticonvulsants, anticholinesterases) |
| Dry mucosa | Drug-induced xerostomia, salivary hypofunction from Sjögren's syndrome, diabetes, or head and neck cancer radiation therapy |
| Gingival overgrowth | Leukemia, drug induced (phenytoin, cyclosporine, calcium channel blockers) |
| Hard tissue enlargements | Neoplasm, acromegaly, Paget's disease, hyperparathyroidism |
| Mucosal discoloration or hyperpigmentation | Addison's disease, lead poisoning, liver disease, melanoma, drug induced (e.g., zidovudine, tetracycline, oral contraceptives, quinolones) |
| Mucosal erythema and ulceration | Cancer chemotherapy, uremic stomatitis, autoimmune disorders (systemic lupus, Bechet's syndrome), vitamin deficiency, celiac disease, Crohn's disease, drug induced, self-injurious behavior |
| Mucosal pallor | Anemia, vitamin deficiency |

**Table 1.2.** (*Continued*)

| | Possible Causative Medical Disease or Therapy |
|---|---|
| Nondental source oral/jaw pain | Referred pain (e.g., cardiac, neurological, musculoskeletal) including myofascial and temporomandibular joints, drug induced (e.g., vincristine chemotherapy), primary neoplasms, cancer metastases, sickle cell crisis pain, primary or secondary neuropathies |
| Opportunistic infections | Immune suppression (from HIV, cancer chemotherapy, hematological malignancy, primary immune deficiency syndromes), poorly controlled diabetes, stress |
| Oral malodor | Renal failure, respiratory infections, gastrointestinal conditions |
| Osteonecrosis | Radiation to the jaw, use of bisphosphonates and other bone-modifying agents |
| Poor wound healing | Immune suppression (from HIV, cancer chemotherapy, primary immune deficiency syndromes), poorly controlled diabetes, malnutrition, vitamin deficiency |
| Soft tissue swellings | Neoplasms, amyloidosis, hemangioma, lymphangioma, acromegaly, interpersonal violence or accidental trauma |
| Trismus | Neoplasm, postradiation therapy, arthritis, posttraumatic mandible condyle fracture |
| | **Dental signs** |
| Early loss of teeth | Neoplasms, nutritional deficiency (e.g., hypophosphatemic vitamin-D-resistant rickets, scurvy), hypophosphatasia, histiocytosis X, Hand–Schüller–Christian disease, Papillon–Lefevre syndrome, acrodynia, juvenile-onset diabetes, immune suppression (e.g., cyclic neutropenia, chronic neutropenia), interpersonal violence or other traumatic injury, radiation therapy to the jaw, dentin dysplasia, Trisomy 21-Down syndrome, early-onset periodontitis |
| Rampant dental caries | Salivary hypofunction from disease (e.g., Sjögren's syndrome), post radiation, or xerogenic medications; illegal drug use (e.g., methamphetamines); inability to cooperate with oral hygiene and diet instructions |
| Tooth discoloration | Genetic defects in enamel or dentin (e.g., amelogenesis imperfecta, dentinogenesis imperfect), porphyria, hyperbilirubinemia, drug induced (e.g., tetracycline) |
| Tooth enamel erosion | Gastroesophageal reflux disease, bulimia nervosa |

**Table 1.3.** Dental Radiographic Signs Suggestive of Medical Disease or Therapy

| Dental Radiographic Signs | Possible Causative Medical Disease or Therapy |
|---|---|
| Carotid artery calcification | Carotid arteritis, stroke or transient ischemic attack-related disease, hypertension, hyperlipidemia, heart disease |
| Condyle/temporomandibular joint (TMJ) articular space destruction | Rheumatoid arthritis, osteoarthritis |
| Marrow hyperplasia, increased spacing of bony trabeculae, generalized radiolucency | Sickle cell anemia, osteopenia, osteoporosis, malnutrition, secondary hyperparathyroidism from renal disease—renal osteodystrophy |
| Marrow hypoplasia, generalized increased density-radiopacity | Osteopetrosis, Paget's disease, hypoparathyroidism |
| Reduced cortical bone density | Primary hyperparathyroidism |
| Resorption of angle of the mandible | Scleroderma |
| Well-defined radiolucencies not associated with teeth | Neoplasms, multiple myeloma, metastatic cancer |

**Table 1.4.** Top 25 Most Commonly Used Prescription and Over-the-Counter Drugs, 1-Week Prevalence, by Gender/Age (in Years) (Adapted from Kaufman et al.[14])

| Rank | Total Adult, % use | Drug[a] | Men, % Use in Age Group | | | Women, % Use in Age Group | | |
|---|---|---|---|---|---|---|---|---|
| | | | 18–44 y | 45–64 y | ≥65 y | 18–44 y | 45–64 y | ≥65 y |
| 1 | 23 | Acetaminophen | 20 | 16 | 16 | 28 | 25 | 27 |
| 2 | 17 | Ibuprofen | 15 | 13 | 7 | 24 | 22 | 8 |
| 3 | 17 | Aspirin | 10 | 22 | 39 | 10 | 21 | 23 |
| 4 | 8.1 | Pseudoephedrine | 8 | 6 | 2 | 12 | 9 | 3 |
| 5 | 5.2 | **Conjugated estrogens** | 0 | 0 | 0 | 1 | 21 | 17 |
| 6 | 4.4 | Diphenhydramine hydrochloride | 4 | 3 | 5 | 5 | 6 | 4 |
| 7 | 4.2 | **Levothyroxine sodium** | <1 | 2 | 4 | 3 | 9 | 13 |
| 8 | 4.2 | **Ethinyl estradiol** | 0 | 0 | 0 | 14 | 2 | 0 |
| 9 | 3.9 | Caffeine £ | 3 | 2 | 2 | 6 | 5 | 1 |
| 10 | 3.7 | **Hydrochlorothiazide** | 1 | 4 | 6 | 1 | 6 | 12 |
| 11 | 3.5 | Dextromethorphan hydrobromide | 4 | 1 | <1 | 6 | 3 | 3 |
| 12 | 3.5 | Naproxen | 1 | 3 | 3 | 5 | 4 | 4 |
| 13 | 2.9 | Chlorpheniramine maleate/tannate | 2 | 3 | 1 | 4 | 2 | 2 |
| 14 | 2.6 | **Atrovastatin calcium** | 2 | 7 | 7 | <1 | 2 | 3 |
| 15 | 2.6 | **Linsinopril** | 1 | 3 | 7 | <1 | 4 | 7 |
| 16 | 2.6 | **Medroxyprogesterone acetate** | 0 | 0 | 0 | <1 | 12 | 4 |
| 17 | 2.5 | **Loratadine** | 3 | 2 | 0 | 3 | 4 | 1 |
| 18 | 2.3 | **Furosemide** | <1 | 2 | 12 | 0 | 2 | 9 |
| 19 | 2.3 | Phenylpropanolamine | 2 | 2 | 1 | 3 | 2 | 3 |
| 20 | 2.2 | Ranitidine hydrochloride | 1 | 5 | 4 | 1 | 2 | 3 |
| 21 | 2.2 | **Atenolol** | <1 | 2 | 7 | <1 | 3 | 8 |
| 22 | 2.1 | **Omeprazole** | 1 | 3 | 5 | 1 | 3 | 3 |
| 23 | 2.1 | **Albuterol** | 2 | 1 | 4 | 2 | 3 | 2 |
| 24 | 1.9 | Guanifenesin | 2 | <1 | 2 | 2 | 2 | 3 |
| 25 | 1.8 | **Hydrocodone** | 1 | 1 | <1 | 3 | 2 | 3 |

[a] Prescription drugs in bold font.
y, years; £, excluding caffeine in food and beverages.

**Table 1.5.** Top 10 Most Commonly Used Vitamins/Minerals and Herbal/Supplements, 1-Week Prevalence (Adapted from Kaufman et al.[14])

| Rank | Total Adult, % use | Dietary Supplements |
|---|---|---|
| *Vitamin/mineral* | | |
| | 40 | Any use |
| 1 | 26 | Multivitamin |
| 2 | 10 | Vitamin E |
| 3 | 9.1 | Vitamin C |
| 4 | 8.7 | Calcium |
| 5 | 3.0 | Magnesium |
| 6 | 2.2 | Zinc |
| 7 | 2.2 | Folic acid |
| 8 | 2.1 | Vitamin $B_{12}$ |
| 9 | 1.9 | Vitamin D |
| 10 | 1.8 | Vitamin A |
| *Herbal/supplements* | | |
| | 14 | Any use |
| 1 | 3.3 | Ginseng |
| 2 | 3.2 | *Ginko biloba* extract |
| 3 | 1.9 | *Allium sativum* (garlic) |
| 4 | 1.9 | Glucosamine |
| 5 | 1.3 | St. John's wort |
| 6 | 1.3 | *Echinacea augustifolia* |
| 7 | 1.1 | Lecithin |
| 8 | 1.0 | Chondroitin |
| 9 | 0.9 | Creatine |
| 10 | 0.9 | *Serenoa repens* (saw palmetto) |

**Table 1.6.** Common Dental Drug Interactions[a]

| Patient-Reported Medication | Dentist-Prescribed Drug | Consequence |
|---|---|---|
| | ***Antimicrobial drugs*** | |
| Alcohol | Metronidazole | Disulfuram-like reaction of nausea, vomiting, headache, flushing |
| Antacids and iron supplements | Tetracyclines | Loss of antibacterial action of tetracyclines |
| Atorvastatin, simvastatin, pravastatin | Erythromycin, clarithromycin | Increased statin level precipitating possible muscle weakness and breakdown |
| Carbamazepine | Erythromycin, clarithromycin, doxycycline, itraconazole, ketoconazole | Increased risk of carbamazepine toxicity |
| Cyclosporin | Fluconazole, itraconazole, ketoconazole, amphotericin, clarithromycin | Increased risk of nephrotoxicity |
| Digoxin | Erythromycin, tetracyclines, itraconazole, clarithromycin | Digoxin toxicity |
| Lithium | Metronidazole, tetracyclines | Increased lithium toxicity |
| Methotrexate | Penicillins | Methotrexate toxicity |
| Midazolam and other benzodiazepines | Erythromycin, clarithromycin, ketoconazole, itraconazole | Profound sedation |
| Oral contraceptives | Amoxicillin, erythromycin, tetracyclines, metronidazole, ampicillin, possibly other antibiotics | Contraceptive failure (low risk) (Patient should discuss with physician additional nonhormonal contraception used during antibiotic use and subsequent week.) |
| Phenytoin | Fluconazole, ketoconazole, metronidazole | Increased plasma levels of phenytoin |
| Theophylline | Erythromycin, clarithromycin, ketoconazole, itraconazole | Theophylline toxicity |
| Warfarin | Erythromycin, metronidazole, tetracyclines, ketaconazole, clarithromycin, cephalosporins | Enhanced anticoagulation effect |
| | ***Anti-inflammatory drugs*** | |
| Alcohol | Aspirin | Increased risk of damage to gastric mucosa |
| Captopril, other angiotensin-converting enzyme (ACE) inhibitor | Aspirin, ibuprofen | Reduction in antihypertensive effect |

**Table 1.6.** (*Continued*)

| Patient-Reported Medication | Dentist-Prescribed Drug | Consequence |
|---|---|---|
| Corticosteroids | Aspirin | Risk of salicylate toxicity on steroid withdrawal, increased risk of damage to gastric mucosa |
| Cyclosporin | Aspirin, NSAIDs | Increased risk of nephrotoxicity |
| Digoxin | Aspirin, ibuprofen | Digoxin toxicity |
| Heparin, warfarin | Aspirin, NSAIDs | Risk of hemorrhage |
| Insulin, chlorpropamide, other hypoglycemics | Aspirin | Risk of hypoglycemia |
| Lithium | Ibuprofen, naproxen, celecoxib | Lithium toxicity |
| Methotrexate | Aspirin, ibuprofen, naproxen | Methotrexate toxicity |
| Phenytoin | Aspirin, NSAIDs | Increased plasma levels of phenytoin |
| Valproic acid | Aspirin | Risk of hemorrhage, increased valproate toxicity |
| | ***Other drugs*** | |
| Alcohol, sedative H1 antagonists, neuroleptics, antiepileptics | Diazepam | Excessive sedation, impaired psychomotor skills, possible respiratory depression |
| Levothyroxine | Epinephrine | Coronary insufficiency in patients with coronary artery disease |
| Propranolol, other beta-blockers | Epinephrine | Marked hypertension and reflex bradycardia |
| Tricyclic antidepressants | Epinephrine | Hypertensive reaction and possible cardiac arrhythmias |

[a] This list is constantly changing with new medications and new drug interactions and toxicities reported. The dentist should consult with a contemporary electronic drug interaction program, pharmacist, or the treating physician before prescribing drugs.
NSAIDs, nonsteroidal anti-inflammatory drugs.

**Table 1.7.** Oral Consequences of Systemic Drugs

| Oral Manifestation/ Side Effect | Medications with Reported Oral Side Effect |
|---|---|
| Angioedema | Angiotensin converting enzyme (ACE) inhibitors; H2 blockers |
| Chemo-osteonecrosis of the jaw | IV bisphosphonates (zolendronic acid, pamidornate, clodronate), oral bisphosphonates (alendronate, ibandronate, risedronate, etidronate, tilurdronate), other bone-modifying agents |
| Erythema multiforme | Antimalarials, barbiturates, busulfan, carbamazepine, cefaclor, chlorpropamide, clindamycin, codeine, isoniazid, H2 blockers, methyldopa, penicillins, phenylbutazone, phenytoin, rifampin, salicylates, sulfonamides, tetracyclines |
| Gingival overgrowth | Calcium channel blockers (especially nifedipine and verapamil), cyclosporine, phenytoin |
| Glossitis/coated tongue | Amoxicillin, nitrofurantoin, tetracyclines, triamterine/hydrochlorothiazide |
| Lichenoid reactions | ACE inhibitors, allopurinol, chloropropamide, chloroquine, chlorothiazide, dapsone, furosemide, gold salts, methyldopa, NSAIDs, palladium, penicillamine, propranolol, phenothiazines, quinidine, spironolactone, streptomycin, tetracyclines, tolbutamide, triprolidine |
| Lupus erythematosus-like lesions | Griseofulvin, hydralazine, isoniazid, methyldopa, nitrofurantoin, penicillin phenytoin, primidone, procainamide, rifampin, streptomycin, sulfonamides, tetracyclines, thiouracil, trimethadione |
| Stomatitis/oral ulceration | Carbamazepine, dideoxycytosine, enalapril, erythromycins, fluoxetine, ketoprofen, ofloxacin, piroxicam, cancer chemotherapeutic agents |
| Taste alteration | ACE inhibitors, albuterol, benzodiazepines, carbimazole, chlorhexidine, clofibrate, ethionamide, dimethyl sulfoxide, D-penicillamine, gold salts, griseofulvin, guanfacin, levodopa, lincomycin, lithium, methamphetamines, methocarbamol, metronidazole, nicotine, nortriptyline, phenindione, prednisone, sertraline, tranquilizers |
| Tooth discoloration | Chlorhexidine, nitrofurantoin, tetracyclines |
| Xerostomia | Anticholinergics, anticonvulsants, antidepressants, antihistamines, antihypertensives, antineoplastics, antiparkinsonians, antipsychotics, antispasmodics, central nervous system (CNS) stimulants, diuretics, gastrointestinals, muscle relaxants, narcotics, HIV protease inhibitors, sympathomimetics, systemic bronchodilators |