Index

Note: Page numbers of article titles are in **boldface** type.

A

Accreditation organizations, influence on IPP, 569–570
Acid fast bacillus (AFB), in ambulatory care centers, 796
Acinetobacter sp., environmental transmission of, 622–624, 641
  outbreak investigations of, 664, 674–675
  water safety and, 699
Active surveillance, 579
  in nursing homes, 790, 792–793
Acuity-adaptable patient-care rooms, 719
Adenosine triphosphate (ATP) assays, in surface cleaning monitoring, 644–646
Adenovirus, outbreak investigations of, 664
Adherence, to hand hygiene, 596–598
  barriers to, 598–599
  improving, 600–601
Administrative assistant, as IPCC member, 571, 573
Agar slide cultures, in surface cleaning monitoring, 645
Air, as reservoir of infections, 715–716
Air conditioning systems, safe design of, 718–719
Airborne infection isolation room, 719–720
Airborne precautions, in ambulatory care centers, 796–797
  in nursing homes, 791–792
Alcohol, for patient-care item disinfection, 619
Alcohol-based hand rub, in hand hygiene, 593–594, 596, 598–600
  for nursing homes, 789–790
Alternative health care settings, infection control in, **785–804**
  ambulatory care centers as, 569, 796–799. See also Ambulatory care centers.
  background on, 785
  key points of, 785
  nursing homes as, 786–796. See also Nursing homes (NHs).
Ambulatory care centers. See also specific service or type.
  infection control in, 796–799
  bioterrorism and, 798–799
  communicable disease and, 796–797
  disaster planning and, 798–799
  environmental hygiene for, 797
  isolation management for, 796–797
  safe injection practices, 798
  scope of, 796
  surgical, special interventions for, 797–798
  infection risks in, 569
Ammonium compounds, quaternary, for patient-care item disinfection, 620
Animal bites, immunization for, 735

http://dx.doi.org/10.1016/S0891-5520(16)30057-5
0891-5520/16/$ – see front matter
id.theclinics.com
Animal (continued)
  postexposure prophylaxis for, 746–747
Anthrax, immunization for, 735
Antibiotic-resistant bacteria. See also specific antibiotic or bacteria.
  as health care facility issue, 631
  in developing countries, 808–809
  in nursing homes, 790–791
  informatics identification of, 765–766
  national initiatives for, 773
  public health consequences of, 771–773
Antibiotics, stewardship for, 771–784. See also Antimicrobial stewardship.
  informatics in, 765–766
  susceptibility patterns of, in outbreaks, 670, 765–766
Antimicrobial soap, in hand hygiene, 593
Antimicrobial stewardship, 771–784
  definition of, 773
  economics of, 581, 774, 779–780
  goals of, 773–774
  improved use in, national initiatives for, 773
  in nursing homes, 792–793
  infection control and, 776–780
    device-associated infection prevention in, 778
    disease-based stewardship, 777–778
    drug-based stewardship, 776–777
    implementation barriers to, 778–779
    maintenance of programs, 778–779
    making business care for, 779
    measuring impact of, 779–780
    multidisciplinary bundles in, 777–778
    team members for, 776
  informatics in, 765–766
  key points of, 771
  misuse impact in, 772–773
  overuse impact in, 772–773
  resistance impact on public health, 771–772. See also Antibiotic-resistant bacteria.
  multidrugs in. See Multidrug-resistant organisms (MDROs).
  summary of, 780–781
  team members for, 774–776
    clinical pharmacist as, 775
    health care epidemiologist as, 775
    hospital administration as, 776
    infection preventionist as, 775–776
    infectious disease physician as, 774–775
    information technology as, 775
    microbiology laboratory as, 775
    pharmacy and therapeutics committee as, 776
  use impact in, 772–773
    in developing countries, 808–809
Aseptic techniques, in ambulatory surgical centers, 797–798
Aspergillus sp., outbreak investigations of, 664, 676–677
ATP (adenosine triphosphate) assays, in surface cleaning monitoring, 644–646
Autocratic management style, 574–575
Automated technologies, for surveillance, 579
  fully or semi-, 761

B

Bacillus atrophaeus, 631
Bacteria. See also specific bacteria.
  EOC as source of, 715–716
  HCP exposures to. See Occupational health.
    resistance to antibiotics, 631. See also Antibiotic-resistant bacteria.
Bacterial colonization, in channel scopes, 629–630
  in nursing homes, 790–791
Bacterial DNA, in outbreaks, 671
Behavioral performance/practice, in hand hygiene, 600
Biofilms, in endoscope reprocessing, 621
Bioterrorism/bioterrorism agents, ambulatory surgical centers and, 797–798
  as health care facility issue, 631
Biotyping, of outbreaks, 670
Bites, immunization for, animal, 735
  postexposure prophylaxis for, animal, 746–747
    human, 746
Blades, laryngoscope, HAIs linked to, 630–631
  storage issues of, 629
Bleach, for environmental surface disinfection, 648
Bloodborne pathogens, 568
  in nursing homes, 791–792
  occupational health regulations for, 731
Bloodstream infections, from central lines. See Central line–associated bloodstream infections (CLABSI).
  from laryngoscope blades, 630–631
Budget, IPCC preparation of, 575–577
  reductions in, 583
Building capacity through partnerships, in developing countries, 811–812
Building water distribution systems, LD pneumonia related to, 701
  safety plans for, 703–705
Bundles, multidisciplinary, in antimicrobial stewardship, 777–778
  in developing countries, 811
    treatment protocol, in nursing homes infection prevention programs, 787–789
Burkholderia cepacia, outbreak investigations of, 664
Business case, for antimicrobial stewardship, 779
Business plan, for IPCC, 581–583

C

Campylobacter fetus, outbreak investigations of, 665
Candida sp., outbreak investigations of, 664
Capacity building, through partnerships, in developing countries, 811–812
Capital expenses, in IPCC budget, 576–577
Carbapenem-resistant Enterobacteriaceae (CRE), antimicrobial stewardship for, 772–773
  as health care facility issue, 610, 621–622
Carbapenem-resistant (continued)
  environmental transmission of, 630–631
  outbreak investigations of, 675–676
Case definition, for outbreak investigations, 662–663
Catheter–associated infections (CAUTIs), antimicrobial stewardship for, 778
  as targeted HAI, 569–570, 578
  in developing countries, 806–807, 811
  in nursing homes, 787
  informatics surveillance of, 762–764
CAUTIs. See Catheter–associated infections (CAUTIs).
CDC. See Centers for Disease Control and Prevention (CDC).
Ceilings, safe designs of, 721
Centers for Disease Control and Prevention (CDC), guidelines for disinfection and
  sterilization of medical devices, 610, 621
  HAIs prevalence surveys by, 567–568
  hand hygiene guidelines/indications of, 593–595, 600
  health care reform consultations, 569
  immunization recommendations of, 731
  occupational health regulations of, 731, 735, 750
  on antibiotic resistance, 790
  on antimicrobial stewardship, 772
  on environmental hygiene, 642, 645, 648, 693
  on safe design of health care facilities, 721
  surveillance recommendations of, 577, 810
Centers for Medicare and Medicaid Services (CMS), health care reform consultations,
  568–570
  on surgical equipment infection control, 798
Central line–associated bloodstream infections (CLABSI), antimicrobial stewardship for,
  778
  as targeted HAI, 569–570, 578
  in developing countries, 807, 811
  informatics surveillance of, 761–762
Channel scopes, disinfection and sterilization of, immersion vs. perfusion for, 629–630
Charlson’s Comorbidity Score, 790
Chemical agents, for environmental surface disinfection, 648–649
  for patient-care item sterilization, 613–617
Chemoprophylaxis, postexposure, for HCP, 735–747, 750. See also Postexposure
  prophylaxis (PEP).
CLABSI. See Central line–associated bloodstream infections (CLABSI).
Cleaning, vs. cleanliness, 650–651
Cleaning surfaces, in health care facilities, 642–648
  ambulatory surgical centers as, 797–798
  cleanliness vs., 650–651
  evaluation and monitoring of, 642–644
    benefits and challenges of, 646–648, 650
    objectivity in, 651
    importance of, 642
    improvement strategies for, 643–644, 649–650
    methods for, 644–646
    agar slide cultures as, 645
    ATP assays as, 644–646
basic cultures as, 645
covert direct practice observation as, 645
fluorescent markers as, 644, 646–647
overview of, 644–645
Cleanliness, in environmental hygiene, improving, 655
by evaluating emerging interventions, 655
measuring, 654
vs. cleaning, 650–651
Clinical criteria, for evaluating evidence strength for environmental sources of infection, 714–715
in surveillance data, 577–578
Clinical pharmacist, antimicrobial stewardship role of, 775
Clostridium difficile, antimicrobial stewardship for, 772–774, 778
as targeted infection, 569–570, 578
environmental transmission of, 622–624, 641, 649, 714
in nursing homes, 791
informatics surveillance of, 760–762, 764
outbreak investigation of, 670, 678
CMS. See Centers for Medicare and Medicaid Services (CMS). Combined surveillance methodologies, 578
Communicable disease, electronic reporting of, 766
HCP-to-patient transmission of, 750
in ambulatory care centers, 569, 796
Communication, importance of, during outbreak investigations, 670
Compliance, with hand hygiene, 596–598
barriers to, 598–599
improving, 600–601
Computer science, for surveillance, 579, 761. See also Informatics.
in hand hygiene monitoring, 601
Concurrent surveillance, 576–577
Conflicts, HAI prevention during, in developing countries, 810
Conjunctivitis, in HCP, work restrictions for, 748
Conservation, as water management priority, 696
Construction, of health care facilities, for patient safely and infection prevention, 713–728.
See also Design of health care facilities.
Consultative management style, 574–575
Contact dermatitis, in hand hygiene, 599
Contact precautions, in nursing homes, 791
Containment methods, for construction and renovation, of health care facilities, 718–719
Contaminants, in drinking water, 690–691
in EOC, 713–715
Contaminated surfaces, in health care facilities, cleaning of, 642–648
decontamination of. See Surface decontamination.
disinfecting of, 648–651
epidemiology of, 639–641
Core value statement, of IPPs, 571
Coronavirus, as targeted infection, 631, 640
Cost-effectiveness analysis, of infection control and prevention programs, 581–583
Costs, of infection prevention and control, 581–583, 779–780
in developing countries, 805–806
Cough etiquette, in ambulatory care centers, 796–797
Counseling, as postexposure prophylaxis, in HCP, 736–737
Covert direct practice observation, in surface cleaning monitoring, 645
Creeping outbreak, of LD pneumonia, 702–703
Critical items, disinfection and sterilization of, 613–617
Cultural dimensions, of infection control programs, in developing countries, 813
Cultures, in active surveillance, 579, 790
in surface cleaning monitoring, agar slide, 645
basic, 645
Cystoscopes, disinfection and sterilization of, 629–630
Cytomegalovirus, in HCP, work restrictions for, 748

D
Daily use, defined, as antimicrobial stewardship metric, 779–780
Data, informatics software implementation consideration of, device data challenges in, 767
microbiology data challenges in, 767
validation challenges as, 767–768
Data programmer and analyst, as IPCC member, 571–573
Data sources, for surveillance, active, 579
concurrent or retroactive, 577–578
in nursing homes, 787
informatics and, 761
Data validation, in surveillance, 760–761
informatics software challenges with, 767–768
Days of therapy (DOTs), as antimicrobial stewardship metric, 779–780
Decontamination, of rooms. See Room decontamination.
of surfaces. See Surface decontamination.
Decorative water features, in health care facilities, as transmission risk, 695, 717
Defined daily use, as antimicrobial stewardship metric, 779–780
Democratic management style, 574–575
Denominators, in hospital rate of infection, 578–579
Dental clinics, infection prevention programs in, 796
Dental unit waterlines, infection risks from, 694
Dermatitis, contact, in hand hygiene, 599
Design of health care facilities, for patient safely and infection prevention, 713–728
evidence strength for environmental sources of infection, criteria for evaluating, 714–715
future directions for, 721–722
informing future guidelines development in, 721–722
trends in, 721
in developing countries, 810, 813
introduction to, 713–714
key points of, 713
resources for, 722
summary discussion of, 722
supportive strategies and elements for, 718–721
air conditioning and, 718–719
airborne infection isolation room as, 719–720
ceilings as, 721
containment methods as, 718–719
FGI guidelines as, 717–718
finishes as, 720–721
floors as, 721
furnishings as, 720–721
handwashing stations as, 716–717, 720
heating and, 718–719
patient-care rooms in, 719–720
protective environment room as, 720
surfaces as, 720–721
toilets as, 720
ventilation and, 718–719
walls as, 721
waste disposal, human, 720
transmission risks and, 715–716
air as reservoir of infections, 715–716
decorative water features in, 695, 717
handwashing stations in, 716–717
inpatient rooms, surfaces, and finishes in, 717–718
water as reservoir of infections, 716
Developing countries, preventing HAIs in, 805–818
gaps and opportunities of, 806–810
after natural disasters, 810
during conflicts, 810
health care-associated tuberculosis as, 809–810
identification of, 807, 812
resource support as, 807
surveillance and rates of HAIs as, 807–808
surveillance of antimicrobial resistance as, 808–809
health and economic impact of, 806
introduction to, 805–806
key points of, 805
recommendations for, 811–814
building capacity through partnerships as, 811–812
designing sustainable programs and interventions as, 813
identification of gaps as, 807, 812
successful interventions for, 810–811
hand hygiene guidelines as, 810
infection control strategy in resource-limited settings as, 810–811
summary of, 814
Device data, informatics software challenges with, 767
Device-associated infection prevention, antimicrobial stewardship for, 778
Device-associated infections. See also specific device.
informatics reduction of, 765
rate calculation of, 579
Diabetic therapy, safe injection practices for, 798
Dialysis, infection risks from, 569, 693
Dialysis centers, infection prevention programs in, 796
Diarrheal diseases, in HCP, work restrictions for, 748
Diphtheria, in HCP, postexposure prophylaxis for, 745
work restrictions for, 748
Direct observation, of hand hygiene compliance, 597–598, 601
Disaster planning, by ambulatory surgical centers, 797–798
Disaster (continued)

in developing countries, 810

Discharge cleaning, thoroughness of, 647

Disease-based antimicrobial stewardship, 777–778

Disinfection, in health care facilities, 609–637

agents and methods for, 618–621. See also High-level disinfection (HLD); Low-level disinfection (LLD).

for surfaces, 648–649

ambulatory surgical centers as, 569, 797–798

of patient-care items, 610–613, 622–624

of surfaces, 648–651

challenges of measuring, 650–651

chemicals for, 648–649

environmental, 610–613, 622–624

improving to decrease contamination, 643–644

technologies to augment, 649–650

no-touch as, 649

self-disinfecting surfaces as, 649–650

Disinfection and sterilization, in health care facilities, 609–637. See also Disinfection; Sterilization.

ambulatory surgical centers as, 569, 797–798

current issues in, 618, 620–631

antibiotic-resistant bacteria as, 631

bioterrorism agents as, 631

carbapenem-resistant Enterobacteriaceae infection as, 610, 621–622

cystoscopes as, 629–630

duodenoscopes as, 610, 621–622

emerging pathogens as, 631

endoscope reprocessing as, 609–610, 618, 620

environment role in transmission as, 622–627

gastroscopes as, 609–610, 618, 621–622

human papilloma virus as, 624, 628

hydrogen peroxide mist system for probes as, 628–629

immersion vs. perfusion of channel scopes as, 629–630

laryngoscopes as, 630–631

patient risk from failures of, 621, 624, 628

reuse of single-use devices as, 629, 797–798

storage of semicritical items as, 613, 629

introduction to, 609–610

key points of, 609

of critical items, 613–617

of noncritical items, 612, 617–620

of semicritical items, 611–617

rational approach to, 610–613

summary of, 631

Disposable wipes, for environmental surface disinfection, 649

Distribution, as water management priority, 692–696. See also Water distribution.

DNA, bacterial, in outbreaks, 671

DNA microarray hybridization, of outbreaks, 671

Dose optimization, for drugs, in antimicrobial stewardship, 773–774

Drinking water, treatment of, 690
Droplet precautions, in nursing homes, 791
Drug selection, in antimicrobial stewardship, 773–774
Drug-based antimicrobial stewardship, 776–777
Duodenoscopes, disinfection and sterilization of, 610, 621–622
Duration of drug therapy, in antimicrobial stewardship, 773–774
  mean, as metric of, 779–780
  in developing countries, 810–811

E

Ecoli O157:H7, outbreak investigations of, 665
Ebola, as targeted infection, 568, 631
Economics, of antimicrobial stewardship, 581, 774, 778–780
  of HAIs in developing countries, 806
  of infection prevention and control, 581–583
Ectoparasites, postexposure prophylaxis for, 747
Elective behavior, in hand hygiene, 600
Electronic communicable disease reporting, 766
Electronic medical records, surveillance and, 579
Emergency supply, as water management priority, 696
Employee health programs. See also Occupational health.
  in nursing homes, 794
Endocavity disinfection, as challenge, 618, 621–622
  trophon for, 628–629
Endoscope reprocessing, for disinfection and sterilization. See also specific scope.
  as health care facility issue, 609–610, 618, 620
  immersion vs. perfusion in, 629–630
  steps for, 618, 620
Endoscopy suites, as high-risk setting for outbreaks, 679–680
Enterobacter sp., carbapenem-resistant. See Carbapenem-resistant Enterobacteriaceae (CRE).
  outbreak investigations of, 665, 678
  water safety and, 700
Enterococcus faecalis, outbreak investigations of, 665
Enterococcus sp., antibiotic-resistant. See Vancomycin-resistant Enterococcus (VRE).
Enterovirus D68, 631
Environment of care (EOC). See also Hospital environment.
  as infection source, criteria evaluating strength of evidence for, 714–716
  designs for prevention of, 716–721
  future design trends for, 721
  informing for development guidelines, 721–722
Environmental hygiene, in health care facilities, 639–660
  ambulatory care centers as, 797
  ambulatory surgical centers as, 797–798
  cleaning surfaces in, 642–648
  cleanliness vs., 650–651
  evaluation and monitoring of, 642–644
  benefits and challenges of, 646–648, 650
  objectivity in, 651
  importance of, 642
  improvement strategies for, 643–644, 649–650
Environmental (continued)
methods for, 644–646
contaminated surfaces in, cleaning of, 642–648
disinfecting of, 648–651
epidemiology of, 641
disinfecting surfaces in, 648–651
challenges of, 650–651
chemicals for, 648–649
improving to decrease contamination, 643–644
technologies to augment, 649–650
hand hygiene and, 651–653
horizontal healthcare hygienic practice in, 640–641
introduction to, 639–641
key points of, 639
research opportunities and challenges for, 653–655
improving cleanliness as, 655
by evaluating emerging interventions, 655
measuring cleanliness as, 654
proposed hygienic practice agenda as, 654
study design improvements as, 653–654
understanding transmission events and patient room surfaces as, 654
term descriptions for, 640, 650–651
Environmental Protection Agency (EPA), 620, 695–696, 716
Environmental rounds, 642
in nursing homes, 795
Environmental services (EVS) personnel, role in surface cleaning, 642–643, 647–648
Environmental surfaces, in health care facilities. See also Surface entries.
as transmission risk, 717–718
cleaning of, 642–651
contaminated, 639–651
disinfection methods for, 610–613, 622–624
safe designs for, 720–721
self-disinfecting, 649–650
sterilization methods for, 610–611, 613, 622–624
EOC. See Environment of care (EOC); Hospital environment.
EPA (Environmental Protection Agency), 620, 695–696, 716
Epidemiologist, health care, antimicrobial stewardship role of, 775
hospital physician. See Hospital physician epidemiologist.
national. See Centers for Disease Control and Prevention (CDC).
Epidemiology, business analyses framework for, 582–583
of contaminated surfaces, in health care facilities, 639–641
of HAIs, 568
in developing countries, 805–806
Escherichia coli, outbreak investigations of, 665
water safety and, 700
ESKAPE pathogens, 772
Ethylene oxide (ETO), for patient-care item sterilization, 613, 616, 622, 630
Evidence-based practice, for disinfection and sterilization, in ambulatory surgical centers,
797–798
of patient-care items, 622
EVS (environmental services) personnel, role in surface cleaning, 642–643, 647–648
Expenses, in IPCC budget, 576–577
Exposure risk, calculation of, 578–579
Exposure risk factor analysis, in outbreak investigations, 664–669
Exposures, in HCP, postexposure prophylaxis for, 735–747, 750. See also Postexposure prophylaxis (PEP).
  pre-exposure interventions for, 731, 733–735. See also Pre-exposure interventions.
  in patients, after failure of disinfection and sterilization, investigation protocol for, 624, 628
  building designs and, 714

F
Fabrics, furniture, safe designs of, 720–721
Failure, in disinfection and sterilization, of patient-care items, 621
  patient risk with, 622, 624
  protocol for exposure investigation after, 624, 628
FDA. See Food and Drug Administration (FD).
First aid, as postexposure prophylaxis, in HCP, 736
Fiscal analysis, as IPCC role, 583
Floors, safe designs of, 721
Fluid administration, safe practices for, 798
Fluorescent markers, in surface cleaning monitoring, 644, 646–647
Focused surveillance, 578
Food and Drug Administration (FD), on disinfection and sterilization of medical devices,
  610, 621–622, 628–629
Food preparation, infection risks from, 693
Funding, for IPCC, 581–583
Fungus, EOC as source of, 714–715
  outbreak in health care settings, 676–677
Furnishings, safe designs of, 720–721

G
Gastroscopes, disinfection and sterilization of, 609–610, 618, 621–622
Genotyping, of outbreaks, 670–671
GlideRite rigid stylets, 631
GlideScope video laryngoscope system, portable, 630–631
Gloves, for HCP, in nursing homes, 790
  in hand hygiene, 599
Glutaraldehyde, for patient-care item sterilization, 614, 624, 628, 630
Government agencies. See also specific agency or department.
  influence on IPP, 568–570
  in developing countries, 812–814
Gowns, for HCP, in nursing homes, 790
Group A streptococcus, in HCP, work restrictions for, 749

H
HAI identification, antibiotic-resistant bacteria and, informatics for, 765–766
  as outbreak source, 662–664
  in developing countries, 807, 812
HAIs. See *Health care-associated infections (HAIs).*

Hand antisepsis, in hand hygiene, 593

Hand hygiene (HH), **591–607**
- adherence to, 596–598
- barriers to, 598–599
- improving, 600–601
- alcohol-based hand rubs, 593–594, 596, 598–600
- as targeted strategy, 569–570
- CDC guidelines/indications for, 593–595
- definition of, 593
- environmental hygiene and, 651–653
- evolution of guidelines for, 593–594
- HAIs prevention with, 591–592, 601–602
- handwashing stations and, 720
- human skin and skin flora in, 592–593
- in developing countries, 810
- introduction to, 591
- key points of, 591
- summary of, 602–603
- terms for, 592–593

Hand hygiene events, monitoring of, 598

Hand rub, in hand hygiene, alcohol-based, 593–594, 596, 598–600
- for nursing homes, 789–790
- surgical, 593

Handles, of laryngoscopes, HAIs linked to, 630–631

Handwashing, in hand hygiene, 592–593

Handwashing stations, in health care facilities, as transmission risk, 716–717
- safe designs of, 720

HAV. See *Hepatitis A (HAV).*

HBV. See *Hepatitis B (HBV).*

HCP. See *Health care personnel (HCP).*

HCV. See *Hepatitis C (HCV).*

Health care epidemiologist, antimicrobial stewardship role of, 775

Health care facilities/settings, alternative, **785–804.** See also *Alternative health care settings.*
- designing for patient safely and infection prevention, **713–728.** See also *Design of health care facilities.*
- disinfection and sterilization in, **609–637.** See also *Disinfection and sterilization.*
- environmental hygiene of, **639–660.** See also *Environmental hygiene.*
- future design trends for, 721
- informing for development guidelines, 721–722
- infection control in. See *Infection control program.*
- infection prevention in. See *Infection prevention program (IPP).*
- occupational health for, 730. See also *Occupational health.*

Health care personnel (HCP), as infection source, 714
- as outbreak source, 672
- cleaning patient-care items, 622
- hand hygiene education for, 600
- in developing countries, education strategies for, 813–814
- in nursing homes, infection prevention education for, 795
- occupational health for, **729–757.** See also *Occupational health.*
professional role of, in hand hygiene, 599–600
protection of, as IPP goal, 568
Health care practices, optimal, reimbursement and, 568–569, 582–583
Health care reform, for nursing homes, 787, 795–796
paradigm shift in infection programs, 569
Health care workers. See Health care personnel (HCP).
Health care-associated infections (HAIs), environmental transmission of. See also Health care facilities/settings.
epidemiology of, 639–641
hygiene prevention of, 639–660. See also Environmental hygiene.
reducing, 622–624. See also Disinfection; Sterilization.
hand hygiene prevention of, 591–592, 601–602
identification of. See HAI identification.
in low-income and middle-income countries, 805–818. See also Developing countries.
most common types of, 568
prevalence surveys of, 567–568
prevention programs for. See Infection control program; Infection prevention program (IPP).
surveillance of. See Surveillance entries.
targeted categories of, 569–570
water-based. See Water safety.
Health status, HAIs impact on, in developing countries, 806, 812
Heater-cooler devices, infection risks from, 694
Heating systems, safe design of, 718–719
Hemodialysis, infection risks from, 569, 693
Hemodialysis centers, infection prevention programs in, 796
HEPA (high-efficiency particulate air) filters, 720
Hepatitis A (HAV), in HCP, immunization for, 735
postexposure prophylaxis for, 745–746
work restrictions for, 748
outbreak investigations of, 665
Hepatitis B (HBV), in HCP, immunity proof for, 733
immunization for, 731, 733–734
special use of, 733–735
postexposure prophylaxis for, 739–740
work restrictions for, 748
outbreak investigations of, 666, 798
Hepatitis C (HCV), in HCP, work restrictions for, 748
outbreak investigations of, 666
Herpes simplex, in HCP, work restrictions for, 748
Herpes virus, outbreak investigations of, 666
HH. See Hand hygiene (HH).
High-efficiency particulate air (HEPA) filters, 720
High-level disinfection (HLD), agents and methods for, 613–617
of patient-care items and environmental surfaces, 610–611, 613, 617–618, 621–622, 628, 630–631. See also Ultraviolet (UV) light.
High-risk settings, for infection outbreaks, 678–680
HIV. See Human immunodeficiency virus (HIV).
Hospital administration, antimicrobial stewardship role of, 776
Hospital environment. See also Environment entries.
as infection source, criteria evaluating strength of evidence for, 714–715
Hospital (continued)
  as outbreak source, 672
  role in transmission, 622–627
Hospital physician epidemiologist, as IPCC member, 571–573
  environmental monitoring role of, 648
  primary responsibilities of, 573
Hospital rate of infection, 570, 578
  calculation of, 578–579
Hospital-acquired conditions (HACs), as infection reduction target, 569
  economic impact of, 581–582
    in developing countries, 805–806
  value-based purchasing and, 582–583
Hospital-acquired infections. See Health care-associated infections (HAIs).
HP. See Hydrogen peroxide entries.
Human bites, postexposure prophylaxis for, 746
Human immunodeficiency virus (HIV), postexposure prophylaxis for, 739, 741
  work restrictions for, 748
Human papilloma virus, as health care facility issue, 624, 628
  environmental transmission of, 631, 649
Human skin, hand hygiene and, 592–593
Human waste disposal, in design of health care facilities, 720
HVAC systems, safe design of, 718–719, 721
Hydrogen peroxide (HP) gas plasma, for patient-care item disinfection, improved, 619
  for patient-care item sterilization, 613–614, 616
    improved, 615
    ozone and, 617
    vaporized, 616
Hydrogen peroxide mist system for probes, 628–629
Hydrogen peroxide (HP) systems, for environmental surface disinfection, 648
  for laryngoscope disinfection, 630
  for room decontamination, 624
    advantages vs. disadvantages of, 624, 627
    clinical trials on, 624–626
    UV light vs., 624
Hydrotherapy, infection risks from, 693
Hygienic practice, continuum of, 651–652
  elements of, 651–652
    horizontal healthcare, 640–641
    interventions for, 651, 653
      evaluation cleanliness based on, 655
      sequential, 601
  research agenda for, 654
Hypothesis analysis, of risk factors, for outbreaks, 663

I
ICAT (infection prevention and control assessment tools), for developing countries, 812
Ice machines, infection risks from, 693, 716
ICRA (infection control risk assessment), 715, 718, 722
Immersion of channel scopes, for disinfection and sterilization, 629–630
Immunity, proof of, in HCP, 731, 733
Immunizations, as pre-exposure intervention, for HCP, contraindications to, 735
  immunity proof vs., 731, 733
  recommendations for, 731–732, 734
  special use, 734–735
Immunocompromised personnel, immunizations for, 733
Incident report, for postexposure prophylaxis, in HCP, 736
Infection control program, antimicrobial stewardship in, 771–784. See also Antimicrobial stewardship.
  as team member, 776–780
  in health care facilities. See also Infection prevention program (IPP).
    alternative settings for, 785–804
    building a successful, 567–589
  in low-income and middle-income countries, 805–818. See also Developing countries.
  informatics in, 759–770. See also Informatics.
    background on, 759–760
    efficacy of, 759–760
    implementing software for, 766–768
    infection prevention and, 759, 764–766
    infection surveillance and, 759–764
    key points of, 759
    public health and, 766
    summary of, 768
    term description for, 759
Infection control risk assessment (ICRA), 715, 718, 722
Infection control risk mitigation recommendations (ICRMR), 718
Infection precautions. See Isolation precautions.
Infection prevention and control assessment tools (ICAT), for developing countries, 812
Infection prevention and control committee (IPCC), in health care facilities, authority of, 571
  budget preparation by, 575–577
  key members of, 571–575
  management styles effect on, 574–575
  meeting management strategies for, 574, 576
  multidisciplinary members of, 571, 581
  primary responsibilities of, 572
  review of surveillance findings, 571–572
Infection prevention program (IPP), in health care facilities, alternative settings of, 785–804. See also Alternative health care settings.
  ambulatory care centers as, 569, 796–799
  background on, 785, 799
  nursing homes as, 786–796
  antimicrobials in, 771–784. See also Antibiotics; Antimicrobial entries.
  designing for patient safety, 713–728. See also Design of health care facilities.
  disinfection and sterilization in, 609–637. See also Disinfection; Sterilization.
  environmental hygiene of, 639–660. See also Environmental hygiene.
  hand hygiene in, 591–607. See also Hand hygiene (HH).
  informatics in, 759–770. See also Informatics.
  Legionella pneumophlia and, 689–712. See also Legionella pneumophlia; Water entries.
  occupational health in, 729–757. See also Occupational health.
  of low-income and middle-income countries, 805–818. See also Developing countries.
Infection (continued)
outbreak investigations in, 579–580, 661–687. See also Outbreaks.
successful for HAIs prevention, 567–589. See also Health care-associated infections (HAIs).
components of, 570–572
   budget as, 575–577, 583
   business plan as, 581–583
   committee as, 571–572
   mission, vision, and values as, 570–571
   outbreak investigations as, 579–580, 661
   quality improvement as, 581
   surveillance as, 576–579
   team members as, 572–575
current initiatives for, 568–569
economics and, 581–583, 774, 779–780
   in developing countries, 805–806
evolution of regulation and requirements for, 567–570
in alternative health care settings, 785–804. See also Alternative health care settings.
key points of, 567
major goals of, 568
summary of, 583
team for, committee in, 571–572
   key members of, 572–575
team meeting management in, 574–576
team members for, 572–575
   administrative assistant as, 571, 573
   data programmer and analyst, 571–573
   hospital physician epidemiologist as, 571–573
   infection prevention staffing as, 571, 574–575
   infection preventionist as, 571, 573–574, 581
   medical director of infection prevention as, 571–573
Infection prevention staffing, as IPCC member, 571, 574–575
Infection preventionist (IP), activities reported by, 577
   electronic via informatics, 766
   antimicrobial stewardship role of, 775–776. See also Antimicrobial stewardship.
as IPCC member, 571, 573–574, 581
ICRA developed by, 715
in nursing homes, 794–795
management styles of, 574–575
nursing home role of, 786–796
primary responsibilities of, 574
Infection rate, in developing countries, 807–808
   in hospital, 570, 578
      calculation of, 578–579
   in nursing homes, 792–793
Infection risk, as high, in nursing homes, 793
   from critical items for patient-care, 613
   from water uses, 692–694
   in hospital environment, criteria for evaluating, 714–715
      of outbreaks, 672–674
nosocomial, 568, 806. See also Health care-associated infections (HAIs).
Infectious diseases physician, antimicrobial stewardship role of, 774–775
Influenza, immunity proof for, 733
    immunization for, 731, 733–734
    special use of, 733–735
    in developing countries, 808
    postexposure prophylaxis for, 747, 750
Informatics, in infection control, 759–770
    background on, 759–760
    efficacy of, 759–760
    implementing software for, 766–768
    infection prevention and, 759, 764–766
        admission recognition of MDROs, 764–765
        antibiotic stewardship, 765–766
        identification of inappropriate precautions, 765
        reduction of device use, 765
    infection surveillance and, 759–764
        data sources for, 761
        fully automated vs. semiautomated, 761
        outbreak detection with, 764, 766
        subjective vs. objective, 579, 760–761
    key points of, 759
    medical, for surveillance, 579
    metric enhancement with, 761–764
        for C difficile, 760–762, 764
        for catheter-associated urinary tract infections, 762–764
        for central line–associated bloodstream infections, 761–762
        for multidrug-resistant organisms, 762, 764
        for surgical site infections, 762–763
        for ventilator-associated pneumonia, 762–763
    public health and, 766
    summary of, 768
    term description for, 759
Informatics software, implementing, 766–768
    data validation in, 767–768
    device data challenges in, 767
    general considerations for, 766
    microbiology data challenges in, 767
Information technology. See also Computer science.
    antimicrobial stewardship role of, 775
Inherent behavior, in hand hygiene, 600
Injection practices, safe, in ambulatory care centers, 798
    in nursing homes, 791
Instrument asepsis, in ambulatory surgical centers, 797–798
Instrument design, in endoscope reprocessing, 621
Intensive care unit (ICU), designs for patient safety and infection prevention, 716, 720–721
    hand hygiene in, 598, 600–601
    in developing countries, 806, 810–811, 813
Intravenous therapy, safe practices for, 798
Iodophors, for patient-care item disinfection, 620
IP. See Infection preventionist (IP).
IPCC. See *Infection prevention and control committee (IPCC).*
IPP. See *Infection prevention program (IPP).*
Isolation precautions, in ambulatory care centers, 796–797
  in nursing homes, 791–792
  inappropriate, informatics identification of, 765
Isolation room, for airborne infection, 719–720, 796

K
*Klebsiella pneumoniae*, outbreak investigations of, 666
  water safety and, 700

L
Labor expenses, in IPCC budget, 576–577
Laboratory, microbiology, antimicrobial stewardship role of, 775
Laboratory tests, for outbreaks, in health care settings, 670–671
Laryngoscope blades, HAIs linked to, 630
  storage issues of, 629
Laryngoscopes, disinfection and sterilization of, 630–631
LD pneumonia, building water distribution systems and, 701
  description of, 697
  unapparent or creeping outbreak of, 702–703
Leak testing, of endoscopes, for disinfection and sterilization, 618
*Legionella pneumophila*, water safety and, in health care, 689–712
  building water safety plans for, 703–705
  decision points for, 703–704
  infections prevention plan in, 704–705
  stakeholders in, 704–705
  team approach to, 703–704
  future of, 706
  introduction to, 690–691
  key points of, 689
  outbreak investigations of, 666, 673–674
  pathogens and, 690–703
    transmission routes of, 690–691
  pneumonia and, building water distribution systems in, 701
    description of, 697
    unapparent or creeping outbreak in, 702–703
  summary of, 706
  water distribution systems and, 690–691
  water management priorities for, 691–696
    conservation as, 696
    distribution and quality as, 692
    emergency security as, 696
    safety as, 692–696
  water uses and infection risks of, 692–694
  water-based HAIs and, 696–703
    *Acinetobacter sp.* as, 699
    *E coli* as, 700
    *Enterobacteriaceae sp.* as, 700
Klebsiella sp. as, 700
Legionella sp. as, 696–698, 701–703
Mycobacterium sp. as, 698
NTM as, 690–691, 698
other gram-negative pathogens as, 700
Pseudomonas aeruginosa as, 690–691, 699
scope of, 696–697
Stenotrophomonas maltophilia as, 699
Legislation, on health care reform, effect on infection programs, 569
Level of care, in nursing home settings, information transfer during transitions of, 788–789
Listeria monocytogenes, outbreak investigations of, 667
Low-income and middle-income countries (LMIC), preventing HAIs in, 805–818. See also Developing countries.
Low-level disinfection (LLD), of patient-care items and environmental surfaces, 610, 612–613

M
Management strategies, for IPCC meetings, 574, 576
Management styles, in IPCC meetings, 574–575
McGrath video laryngoscope system, 630
MDROs. See Multidrug-resistant organisms (MDROs).
Measles, in HCP. See also Rubella.
  immunity proof for, 733
  immunization for, 731, 733–734
  special use of, 733–735
  postexposure prophylaxis for, 745
  work restrictions for, 748
Mechanical (no-touch) methods, for environmental surface disinfection, 649
  for room decontamination, 623
Medical director of infection prevention, as IPCC member, 571–573
  primary responsibilities of, 573
Medical informatics, for surveillance, 579. See also Informatics.
Medication preparation, infection risks from, 693
Medication therapies, optimizing patient outcomes with, 773–774. See also Antimicrobial stewardship.
Meningococcal infections, in HCP, immunization for, 731, 733–734
  special use of, 733–735
  postexposure prophylaxis for, 741–742
  work restrictions for, 748
Methicillin-resistant Staphylococcus aureus (MRSA), antimicrobial stewardship and, 772
  as targeted infection, 569–570
  environmental transmission of, 622–624, 641, 644
  in HCP, work restrictions for, 749
  in nursing homes, 787—791
  outbreak investigations of, 676
Microbiology, of outbreaks, in health care settings, 670
Microbiology data, informatics software challenges with, 767
Microbiology laboratory, antimicrobial stewardship role of, 775
Microorganisms. See Pathogens.
Middle-income countries, preventing HAIs in, 805–818. See also Developing countries.
Ministries of Health, in developing countries, 812
Miscellaneous expenses, in IPCC budget, 576–577
Mission statement, of IPPs, 570
Mist system for probes, hydrogen peroxide, 628–629
Mold, outbreak in health care settings, 676–677
Molecular testing, of outbreaks, 670
MRSA. See *Methicillin-resistant Staphylococcus aureus (MRSA)*.
Multidisciplinary bundles, in antimicrobial stewardship, 777–778
Multidisciplinary team, for antimicrobial stewardship, 774–776
for infection prevention and control, 571, 581
Multidrug-resistant organisms (MDROs), antimicrobial stewardship for, 772–773
as targeted infection, 570, 578, 621, 631
economic impact of, 581–582, 774
environmental transmission of, 622–623, 641, 714
in nursing homes, 768–788, 790–794
informatics recognition during admission, 764–765
informatics surveillance of, 762, 764
rate calculation of, 579
Multilocus sequence typing (MST), of outbreaks, 671
Mumps, in HCP, immunity proof for, 733
immunization for, 731, 733–734
special use of, 733–735
work restrictions for, 749
*Mycobacterium chelonea*, 631
*Mycobacterium terrae*, 628–629
*Mycobacterium tuberculosis*, 631
in HCP, work restrictions for, 749
outbreak investigations of, 667
water safety and, 698

N
National Healthcare Safety Network (NHSN), antimicrobial stewardship and, 780
as surveillance data source, 573, 578
Natural disasters, HAI prevention after, in developing countries, 810
Needlestick injuries. See also *Safe injection practices*.
postexposure prophylaxis for, 731, 737–739
reduction methods for, 738
Negative pressure room, in ambulatory care centers, 796
Neonatal intensive care unit (NICU), as high-risk setting for outbreaks, 678–679
NHs. See *Nursing homes (NHs)*.
Noncritical items, disinfection and sterilization of, 612, 617–620
Nonpotable water (process water), safety issues of, 692, 695–696, 716
Nontuberculous mycobacteria (NTM), outbreak investigations of, 667, 674
water safety and, 690–691, 698
Norovirus, as targeted infection, 631
Nosocomial infections, 568, 806. See also *Health care-associated infections (HAIs)*.
No-touch (mechanical) methods, for environmental surface disinfection, 649
for room decontamination, 623
Numerators, in hospital rate of infection, 579
Nursing homes (NHs), infection prevention programs in, 786–796
CAUTIs in, 787
components of, 787
employee health programs and, 794
environmental hygiene for, 794
environmental rounds for, 795
evolution of, 786
functions of, 787
hand hygiene for, 787, 789–790
infection preventionist role in, 794–795
information transfer during care transitions, 788–789
isolation precautions for, 791–792
MDROs and, 768–788, 790–794
MRSA in, 787—791
outbreak management for, 791–793
oversight of, 787–788, 795–796
protocol bundles for, 787–789
rehabilitation services and, 793–794
resident health programs and, 794
resources for, 787–788
safe injection practices for, 791
staff education on, 795
surveillance for, 792–793

O

Occupational health, infection prevention in, 729–757
components of, 731–732
definitions for, 730–732
health care personnel covered by, 730
health care settings included in, 730
ill health care personnel evaluations for, 748–750
in developing countries, 809–810
in nursing homes, 794
introduction to, 729–730
key points of, 729, 732
postexposure prophylaxis for, 732, 735–747, 750
  animal bites, 746–747
counseling in, 736–737
diphtheria, 745
ectoparasites, 747
general guidelines of, 735–736
hepatitis A, 745–746
hepatitis B, 739–740
human bites, 746
human immunodeficiency virus, 739, 741
influenza, 747, 750
measles, 745
meningococcal infections, invasive, 741–742
pertussis, 743–744
protocol for, 736
rabies, 746–747
Occupational (continued)
    sharps injuries in, 731, 737–739
    syphilis, 747
    tetanus, 744
    varicella, 742–743
    pre-exposure interventions for, immunizations as, 731, 733–735
    contraindications to, 735
    immunity proof vs., 731, 733
    recommendations for, 731, 734
    special use, 734–735
    screening as, 731–732
    professional guidelines for, 731
    scope of programs, 731
    work restrictions for health care personnel, 732, 748–750
Occupational Health and Safety Administration (OSHA), 731
Occupational health services (OHSs), 730–731
Occupational therapy (OT), in nursing homes, infection prevention for, 793–794
OPA (ortho-phthalaldehyde), for patient-care item sterilization, 614, 624, 628
Optical mapping, of outbreaks, 671
Ortho-phthalaldehyde (OPA), for patient-care item sterilization, 614, 624, 628
Outbreaks, in health care settings, 661–687
    approach to, 662–670
    definitions of, 662–663
    delay in identification of, 662
    diagnosis verification for, 662–663
    high-risk settings for, 678–680
        endoscopy suites as, 679–680
        NICU as, 678–679
        transplant units as, 680
    hospital unit closures due to, 662
    hypothesis analysis of risk factors for, 663
    specific organism exposures in, 664–669
    impact on patients, 662
    informatics detection of, 764, 766
    introduction to, 661–662
    investigations of, case definition for, 662–663
        communication importance during, 670
        exposure risk factor analysis in, 664–669
        laboratory and testing in, 670–671
        primary components in, 579–580, 662–663, 670
        source identification in, 662–664
    key points of, 661
    LD pneumonia as, 702–703
    measures to stop, 663, 670
    nursing homes as, 793
    of SARS, 662, 677
    organisms in, 674–678
        *Acinetobacter sp.* as, 664, 674–675
        adenovirus as, 664
        *Aspergillus sp.* as, 664, 676–677
        *C difficile* as, 671, 678
Campylobacter fetus.  as, 665
Candida sp..  as, 664
carbapenem-resistant Enterobacteriaceae as, 675–676
coronaviruses as, 677
E coli.  as, 665
Enterobacter sp.  as, 665, 678
exposure risk analysis of, 664–669
fungus as, 676–677
gastrointestinal infections as, 665, 668, 678
hepatitis A, B, and C as, 665–666, 798
herpes virus as, 666
influenza A and B as, 677
Klebsiella pneumoniae as, 666
Legionella sp.  as, 666, 673–674
Listeria monocytogenes .  as, 667
MERS as, 677
mold as, 676–677
MRSA as, 676
Mycobacterium tuberculosis.  as, 667
nontuberculous mycobacteria as, 667, 674
pertussis as, 677–678
Pseudomonas sp.  as, 667, 675
Ralstonia pickettii as, 667
respiratory infections as, 662, 666, 677
rotovirus as, 662
S aureus as, 668–669, 671, 676
Salmonella sp.  as, 667
SARS as, 662, 677
Serratia marcescens as, 668
Streptococcus pyogenes as, 669
varicella as, 669
Yersinia enterocolitica as, 669
pseudo-outbreaks vs., 670
sources of, 672–674
health care personnel as, 672
hospital environment as, 672
identification of, 662–664
waterborne, 672–674
summary of, 680
Outcome measures, of aseptic practices, in ambulatory surgical centers, 797–798
Outpatient settings, for health care.  See Ambulatory care centers; specific service or type.
Oversight committee, for infection control, in nursing homes, 787–788, 795–796
for nursing homes, 787–788, 795–796

P
Parasite infestations, postexposure prophylaxis for, 747
Partnerships, for capacity building, in developing countries, 811–812
Pathogens.  See also specific microorganism.
   bloodborne, 568
   in nursing homes, 791–792
Pathogens (continued)
  occupational health regulations for, 731
  emerging, as health care facility issue, 631
  EOC as source of, 714–716
  ESKAPE, 772
  outbreak investigations of, 663
      exposure risk analysis of, 664–669
      organisms in, 674–678
  resistance to antimicrobials. See Antibiotic-resistant bacteria.
    water-based. See Waterborne pathogens.
Patient outcomes, with medication therapies, strategies for optimizing, 773–774. See also Antimicrobial stewardship.
Patient risk, from disinfection and sterilization failures, as health care facility issue, 621–622, 624
    protocol for exposure investigation after, 624, 628
Patient role, in hand hygiene, 600
Patient safety, designing health care facilities for, 713–728. See also Design of health care facilities.
Patient safety initiatives, as IPP goal, 568
Patient-care items, disinfection and sterilization of, critical items, 613–617
    in ambulatory surgical centers, 797–798
    noncritical items, 612, 617–620
    semicritical items, 611–617
    disinfection methods for, 610–613
    sterilization methods for, 610–611, 613
Patient-care rooms, as infection transmission risk, 717–718
    cleaning of. See Discharge cleaning; Room decontamination.
    safe design of, 719–720, 796
PE (protective environment) room, 720
PEP. See Postexposure prophylaxis (PEP).
Peracetic acid, for environmental surface disinfection, 648
    for patient-care item sterilization, 615
Peracetic acid/HP, for environmental surface disinfection, 648
    for patient-care item disinfection, 620
    for patient-care item sterilization, 614
Performance feedback, in hand hygiene, 600–601
Perfusion of channel scopes, for disinfection and sterilization, 629–630
Pertussis, in HCP, immunity proof for, 733
    immunization for, 731, 733–734
       special use of, 733–735
    postexposure prophylaxis for, 743–744
    work restrictions for, 749
PFGE (pulse field gel electrophoresis), for outbreaks, 671
Phage typing, of outbreaks, 670
Pharmacist, clinical, antimicrobial stewardship role of, 775
Pharmacy. See also Medication therapies.
    infection risks from, 693
Pharmacy and therapeutics (P & T) committee, antimicrobial stewardship role of, 776
Phenolics, for patient-care item disinfection, 620
Physical Self Maintenance Score (PSMS), 790
Physical therapy (PT), in nursing homes, infection prevention for, 793–794
Physician epidemiologist. See *Hospital physician epidemiologist*.

Physicians, hand hygiene in, 599, 601

Plain soap, in hand hygiene, 592–593

Plasmid typing, of outbreaks, 670

Pneumonia. See *LD pneumonia; Ventilator-associated pneumonia (VAP)*.

Poliomyelitis, immunization for, 735

Polymerase chain reaction (PCR), for outbreaks, 671

Postexposure prophylaxis (PEP), for HCP, 732, 735–747, 750

- animal bites, 746–747
- counseling in, 736–737
- diphtheria, 745
- ectoparasites, 747
- general guidelines of, 735–736
- hepatitis A, 745–746
- hepatitis B, 739–740
- human bites, 746
- human immunodeficiency virus, 739, 741
- illness evaluation and, 750
- influenza, 747, 750
- meningococcal infections, invasive, 741–742
- pertussis, 743–744
- protocol for management, 736
- rabies, 746–747
- sharps injuries in, 737–739
- syphilis, 747
- tetanus, 744
- varicella, 742–743
- work restrictions and, 748–750

Precautions, infection, in ambulatory care centers, 796–797

- in nursing homes, 791–792
- inappropriate, informatics identification of, 765

Pre-exposure interventions, for HCP, 731, 733–735

- immunizations as, 731, 733–735
- contraindications to, 735
- immunity proof vs., 731, 733
- recommendations for, 731, 734
- special use, 734–735
- screening as, 731–732

Pregnant personnel, immunizations for, 734–735

Prevalence surveys, of HAI s, 567–568

Probes, hydrogen peroxide mist system for, 628–629

Process education, on disinfection and sterilization, in ambulatory surgical centers, 797–798

- of patient-care items, 622

Process (nonpotable) water, safety issues of, 692, 695–696, 716

Product consumption evaluation, in hand hygiene compliance, 597–598, 601

Product education, in hand hygiene, 600

Professional role, of NCP, in hand hygiene, 599–600

Professional societies, business analyses framework of, 582–583

- immunization recommendations of, 731
- influence on IPP, 568
Professional (continued)
- occupational health recommendations of, 735
- on ambulatory surgical center programs, 797–798
- on antibiotic resistance, 790–791
- on designing health care facilities, 717–722
- support of automated surveillance technologies, 579

Protection, of health care workers, as IPP goal, 568

Protective environment (PE room), 720

Protocol bundles, in developing countries, 811
- in nursing homes infection prevention programs, 787–789

*Pseudomonas sp.*, environmental transmission of, 641
- outbreak investigations of, 667, 675
- water safety and, 690–691, 699

Pseudo-outbreaks, in health care settings, 670

PSMS (Physical Self Maintenance Score), 790

PT (physical therapy), in nursing homes, infection prevention for, 793–794

Public health, informatics and, 766

Public water utilities, 690

Pulse field gel electrophoresis (PFGE), for outbreaks, 671

Q

Quality, as water management priority, 692–696

Quality improvement, as infection preventionist role, 581

Quaternary ammonium compounds, for patient-care item disinfection, 620

R

Rabies, immunization for, 735
- postexposure prophylaxis for, 746–747

Radiofrequency tracking, in hand hygiene compliance, 598

*Ralstonia pickettii*, outbreak investigations of, 667

Random amplification of polymorphic DNA (RAPD), of outbreaks, 671

Rate of infection. See Infection rate.

Rational approach, to health care facilities disinfection and sterilization, 610–613

Regulatory bodies. See Government agencies.

Rehabilitation services, in nursing homes, infection prevention for, 793–794

Reimbursement, as regulatory leverage, 568–570
- value-based purchasing and, 582–583

Renovation, of health care facilities, for patient safely and infection prevention, 713–728.
- See also Design of health care facilities.

Reporting, of postexposure prophylaxis, for HCP, 736
- of surveillance data, electronic via informatics, 577, 766
- voluntary vs. regulatory, 568–570

Reprocessing, of scopes. See Endoscope reprocessing.

Resident health programs, in nursing homes, 794

Resources, for infection control programs, design of health care facilities and, 722
- in developing countries, as limited, 807
- building capacity through partnerships, 811–812
- identification of, 807, 812
- prioritization of, 813–814
successful interventions despite, 810–811
successful examples of, 810–811
in nursing homes, 787–788
Respiratory equipment, infection risks from, 694
Respiratory hygiene, in ambulatory care centers, 796–797
Respiratory tract infections, in developing countries, 812
  *Legionella pneumophilia* as, 689–712. See also *LD pneumonia.*
  outbreaks of, in health care settings, 662, 666, 677
tuberculosis as. See *Mycobacterium tuberculosis.*
ventilator-related. See *Ventilator-associated pneumonia (VAP).*
  viral, in HCP, work restrictions for, 749
Restriction fragment length polymorphisms (RFLP), of outbreaks, 671
Retrospective surveillance, 577–578
Reuse, of single-use devices, 629, 798
  of single-use instruments, in ambulatory surgical centers, 797–798
Ribotyping, of outbreaks, 671
Risk factors, hypothesis analysis of, for outbreaks, 663
Risk of infection. See *Infection risk; Patient risk.*
RNA probe, for outbreaks, 671
Room decontamination, advantages vs. disadvantages of, 624, 627
  clinical trials on, 624–626
  comparison of methods for, 624
  effectiveness in reducing HAIs, 622–623
  hydrogen peroxide systems for, 624
  in ambulatory surgical centers, 797–798
  no-touch (mechanical) methods for, 623
  ultraviolet light for, 623–624
Rooms. See *Patient-care rooms; specific design.*
Route selection, for drugs, in antimicrobial stewardship, 773–774
Rubella, in HCP, immunity proof for, 733
  immunization for, 731, 733–734
  special use of, 733–735
  work restrictions for, 749

S
Safe injection practices, in ambulatory care centers, 798
  in nursing homes, 791
Safety, as water management priority, 692–696. See also *Water safety.*
  of patients. See *Patient safety initiatives.*
Safety margin, in disinfection and sterilization, 621, 624, 628
*Salmonella sp.*, outbreak investigations of, 667
Scopes, reprocessing of. See *Endoscope reprocessing.*
Screening, pre-exposure, of HCP, 731–732
  in developing countries, 809–810
Security, as water management priority, 696
Self-disinfecting surfaces, 649–650
Self-protection behavior, in hand hygiene, 599
Semicritical items, disinfection and sterilization of, 611–617
  storage issues of, 613, 629
SENIC (Study on the Efficacy of Nosocomial Infection Control), 568, 571, 575
Sequential interventions, for hand hygiene improvement, 601
Serotyping, of outbreaks, 670
*Serratia marcescens*, outbreak investigations of, 668
Sharps injuries. See also Safe injection practices.
  - postexposure prophylaxis for, 731, 737–739
  - reduction methods for, 738
SHEA. See Society for Healthcare Epidemiology of America (SHEA).
Single locus sequence typing (SLST), of outbreaks, 671
Single-occupancy patient-care rooms, 719–720
Single-use devices, reuse of, 629, 798
Single-use instruments, in ambulatory surgical centers, 797–798
Sink accessibility, in hand hygiene, 598
Skin flora, hand hygiene and, 592–593
Smallpox, immunization for, 735
Soap, in hand hygiene, antimicrobial, 593
  - plain, 592–593
Society for Healthcare Epidemiology of America (SHEA), business analyses framework of, 582–583
  - influence on IPP, 568
Sodium hypochlorite, for patient-care item disinfection, 619
Source of outbreaks, in health care settings, 672–674
  - health care personnel as, 672
  - hospital environment as, 672
  - identification of, 662–664
  - waterborne, 672–674
Sporicidal agents, for environmental surface disinfection, 648
SSIs. See *Surgical site infections (SSIs)*.
Stakeholders, in water safety plans, 704–705
Standard precautions, in nursing homes, 791
Standardized infection rate, 578–579
*Staphylococcus aureus*, antibiotic-resistant. See Methicillin-resistant *Staphylococcus aureus* (MRSA).
  - antimicrobial stewardship for, 778
  - hand hygiene and, 591
  - in developing countries, 811
  - outbreak investigations of, 668–669, 671, 676
Steam, for patient-care item sterilization, 616
*Stenotrophomonas maltophilia*, water safety and, 699
Sterilization, in health care facilities, 609–637. See also Disinfection and sterilization.
  - agents and methods for, 613–617
  - of ambulatory surgical centers as, 797–798
  - of patient-care items and environmental surfaces, 610–611, 613, 622–624
Storage, of semicritical items, as infection issue, 613, 629
*Streptococcus*, group A, in HCP, work restrictions for, 749
*Streptococcus pyogenes*, outbreak investigations of, 669
Study on the Efficacy of Nosocomial Infection Control (SENIC), 568, 571, 575
Surface decontamination, in health care facilities, advantages vs. disadvantages of, 624, 627
  - clinical trials on, 624–626
  - comparisons of methods for, 624
  - disinfection methods for, 610–613
improving, 622–624
effectiveness in reducing HAIs, 622–623
sterilization methods for, 610–611, 613
improving, 622–624
Surface finish, as transmission risk, 717–718
safe designs of, 720–721
Surgical hand rub, in hand hygiene, 593
Surgical instruments, disinfection and sterilization of, in ambulatory surgical centers, 797–798
Surgical scrub, in hand hygiene, 593
Surgical site infections (SSIs), as targeted HAI, 569–570, 578
in ambulatory care centers, 797
informatics surveillance of, 762–763
rate calculation of, 579
Surveillance, automated technologies for, 579
fully or semi-, 761
current, 578
data sources for, active, 579
concurrent or retroactive, 577–578
informatics and, 761
definition of, 576–577, 760
in developing countries, gaps and opportunities for, 807–808
of antimicrobial resistance, 808–809
in nursing homes, 790, 792–793
methodologies for, 578–579
priorities for, 578
retrospective, 577–578
subjective vs. objective, 760–761
syndromic, informatics for, 766
Surveillance activities, reported by infection preventionist, 577, 766
Surveillance data, IPCC review of, 571–572
reporting of, electronic via informatics, 577, 766
voluntary vs. regulatory, 568–570
Syndromic surveillance, informatics for, 766
Syphilis, postexposure prophylaxis for, 747

T
Targeted surveillance, 578
TB. See Tuberculosis (TB).
Tdap. See Pertussis.
TDC (thoroughness of disinfection cleaning) score, 642–643
Team approach, to infection prevention and control, 571, 581
to water safety plans, 703–704
Technologies, automated, for surveillance, 579
fully or semi-, 761
in hand hygiene compliance, 597–598, 601
information, 579. See also Computer science.
antimicrobial stewardship role of, 775
to augment disinfection of surfaces, 649–650
Tetanus, immunization for, 735
Tetanus (continued)
postexposure prophylaxis for, 744
The Joint Commission (TJC), hospital accreditation standards of, 568–570
on disinfection and sterilization of medical devices, 629
on isolation precautions, in ambulatory care centers, 797
on safe design of health care facilities, 718
surveillance recommendations of, 577
Thoroughness of discharge cleaning, 647
Thoroughness of disinfection cleaning (TDC) score, 642–643
Time savings, with alcohol-based hand rub, 596, 598–599
TJC. See The Joint Commission (TJC).
Toilets, in design of health care facilities, 720
Total house surveillance, 578
Transmission role, of hands. See Hand hygiene (HH).
  of health care environment, 622–627. See also Environmental hygiene.
  of health care personnel, 750
Transmission routes, of waterborne pathogens, 690–691
Transmission-based precautions, in nursing homes, 791–792
Transplant units, as high-risk setting for outbreaks, 680
Treatment protocol bundles, in developing countries, 811
  in nursing homes infection prevention programs, 787–789
Trophon, for endocavity disinfection, 628–629
Tuberculosis (TB). See also Mycobacterium tuberculosis.
  in developing countries, prevention of, 809–810
  in HCP, work restrictions for, 749

U
Ultraviolet (UV) light, for environmental surface disinfection, 649
  for room decontamination, 623–624
    advantages vs. disadvantages of, 624, 627
    clinical trials of, 624–626
    HP systems vs., 624
Unapparent outbreak, of LD pneumonia, 702–703
Universal patient-care rooms, 719

V
Vaccinia, immunization for, 735
Validation, of data, in surveillance, 760–761
  informatics software challenges with, 767–768
Value statement, core, of IPPs, 571
Value-based purchasing, and HACs, 582–583
Vancomycin-resistant Enterococcus (VRE), antimicrobial stewardship and, 772
  environmental transmission of, 622–624, 630–631, 641, 644
  in nursing homes, 790–791
VAP. See Ventilator-associated pneumonia (VAP).
Varicella, in HCP, immunity proof for, 733
  immunization for, 731, 733–734
    special use of, 733–735
    postexposure prophylaxis for, 742–743
work restrictions for, 749
outbreak investigations of, 669
Ventilation systems, safe design of, 718–719
Ventilator-associated pneumonia (VAP), as targeted HAI, 569, 578
  in developing countries, 806–807, 811, 813
informatics surveillance of, 762–763
Video laryngoscope systems, portable GlideScope, 630–631
Video surveillance, in hand hygiene compliance, 598, 601
Viruses. See also specific virus.
  as health care facility issue, 624, 628–629, 631
  surrogate microbes of, 631
  as targeted infection, 593, 631, 640
  environmental transmission of, 622–624
HCP exposures. See also Occupational health.
  work restrictions for, 749
outbreak investigations of, 662, 664, 666, 677
Vision statement, of IPPs, 570
Visual audits/monitoring, of environment, 642–643
  of hand hygiene compliance, 597–598, 601
  of surface cleaning, 645
VRE. See Vancomycin-resistant Enterococcus (VRE).

W
Walls, safe designs of, 721
Water, as reservoir of infections, 690–691, 716
Water conservation, as priority, 696
Water distribution, as priority, 692–696
  balance between scald prevention and microbial control, 694–695
  construction activities and, 695, 716
  decorative water features and, 695, 717
  disinfectant residual and, 692–694
  leaking pipes/condensation and, 695
  nonpotable water (process water) and, 692, 695–696, 716
  stagnation in pipes and, 692, 716
  thermostatic mixing valves/anti-scald devices and, 695
  water temperature and, 694
Water distribution systems, in health care facilities, as pathogen reservoir, 714–716
  building safety plans for, 703–705
  LD pneumonia related to, 701
Water management priorities, for health care facilities, 691–696
  conservation as, 696
  distribution and quality as, 692
  safety as, 692–696
  security as, 696
Water quality, as priority, 692–696
Water safety, as priority, 692–696
  balance between scald prevention and microbial control and, 694–695
  construction activities and, 695
  decorative water features and, 695, 717
  disinfectant residual and, 692–694
Water (continued)
- leaking pipes/condensation and, 695
- nonpotable water (process water) and, 692, 695–696, 716
- stagnation in pipes and, 692, 716
- thermostatic mixing valves/anti-scald devices and, 695
- water temperature and, 694

*Legionella pneumophilia* and, 689–712. See also *Legionella pneumophilia.*
- outbreak investigations of, 666, 673–674

**Water safety plans, building, 703–705**
- decision points for, 703–704
- *Legionella* prevention plans in, 704–705
- stakeholders in, 704–705
- team approach to, 703–704

**Water security, as priority, 696**

**Water supply, emergency, as priority, 696**

**Water uses, in health care, infection risks of, 692–694**

**Water utility systems, 690, 716**

**Waterborne pathogens, categorized by transmission routes, 690–691, 716**
- in health care facilities, 716
- safety initiatives for. See *Water safety.*
- strength of evidence for, 714–715
- in outbreaks, 672–674

**WGS (whole genomic sequencing), of outbreaks, 671**

**WHO.** See *World Heathcare Organization (WHO).*

**Whole genomic sequencing (WGS), of outbreaks, 671**

**Whole surveillance, 578**

**Wipes, disposable, for environmental surface disinfection, 649**

**Wireless sensors, in hand hygiene compliance, 598, 601**

**Work restrictions, post-exposure, for HCP, 732, 748–750**
- of conjunctivitis, 748
- of cytomegalovirus, 748
- of diarrheal diseases, 748
- of diphtheria, 748
- of group A streptococcus, 749
- of hepatitis A, 748
- of hepatitis B, 748
- of hepatitis C, 748
- of herpes simplex, 748
- of HIV, 748
- of measles, 748
- of meningococcal infections, 748
- of MRSA, 749
- of mumps, 749
- of pertussis, 749
- of rubella, 749
- of tuberculosis, 749
- of varicella, 749
- of viral respiratory tract infections, 749
- of zoster, 749

**World Heathcare Organization (WHO), hand hygiene guidelines/indications of, 600, 651, 789**
on alternative health care settings, 787
on HAIs in developing countries, 806, 808–810, 812

Y
Yersinia enterocolitica, outbreak investigations of, 669

Z
Zero rates, of HAIs, 570
Zoster, in HCP, work restrictions for, 749