

# Prevention and Control of Infections in Hospitals

Practice and Theory

Bjørg Marit Andersen



Springer

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## Preface

*Prevention and Control of Infections in Hospitals: Practice and Theory* deal with infection control, surveillance and hygienic routines and key topics, both practical and theoretical. The book is adapted to a necessary level of infection prevention to cope with today's emerging and resistant microbes, hygienic challenges and emergency preparedness in practical work. It updates current knowledge about infection protection as basic for selecting routines and guidelines to prevent hospital infections.

Healthcare-associated infection (HAI) is primarily a patient safety issue, causing more than 90% of patient injuries. Leaders at all levels in the healthcare system are responsible for patient safety and infection control, from the director of the hospital to the health minister and government, and this should be warranted by law. Lack of management is associated with overcrowding, understaffing, corridor-beds, poor maintenance of buildings and equipment, inadequate cleaning and basic hygienic measures which often lead to HAIs. Hospital infections may occur in 5–20% or more of hospitalized patients. In Europe, at least 7.5 million patients acquire HAI each year, and more than 147,000 patients die directly or indirectly from HAIs each year in European hospitals.

Hospital infections are detected more often after discharge, due to shorter and shorter stay in hospitals. This may lead to spread of resistant bacteria between healthcare levels and less favourable outcome for the patient with infection. Virus like influenza and norovirus follow the patient and may spread like “fire in dry grass”. Entire departments with patients and personnel will be “sick-reported” and must shut down all activity for 2–3 weeks.

The spread of resistant and/or particularly pathogenic, contagious microbes poses a risk to patients, employees, visitors and society as a whole. Dangerous microbes often have a global spread pattern, which requires continuous readiness with effective, limiting measures against epidemics or pandemics.

The book is focused on practical measures against severe hospital infections such as postoperative wound infections; intravascular, blood-borne infections; infections in lower respiratory tract, urinary tract, skin and gastrointestinal tract; and infections in neonates and premature and in other patients with impaired infection defence.

A good hygiene is important to protect patients, visitors and employees against infections. Good hygiene routines, personal infection protection, cleanliness, textile

treatment, sterility, disinfection and high professional hygiene standards for patient care increase patient safety and protect the working environment. Daily infection surveillance, infection detection and adequate contraceptive measures and information are required to stop the spread of infection.

The book is intended to be an aid and an optimal standard in practical work to reduce the incidence of serious hospital infections and spread of infection. This increases the quality of patient treatment; patient safety is better taken care of, and infection control becomes a natural part of measures around hospital patients and employees.

*Prevention and Control of Infections in Hospitals: Practice and Theory* is updated from earlier (1996, 1999, 2003, 2008, 2016) Norwegian handbooks in infection control, lastly published in 2016 (Elefantus forlag, Moss). Each chapter has a practical part and a background information and documentation part.

Thanks to the following colleagues for professional advises and comments:

Infection control nurses, Mette Rasch and Kjersti Hochlin; chief physician, Kjell Olafsen; and professor in medicine, PhD, Inggard Lereim.

In addition, I am grateful to my family, friends and colleagues for friendly assistance and positive support during the writing period. However, my greatest and most enthusiastic fan, my dog, Tito, left forever in May 2018.

*Target groups:* health professionals; doctors, nurses and other health professionals; students in health-related subjects, hospital leaders and health agencies; and patients and their relatives.

Oslo, Norway  
June 2018

Bjørg Marit Andersen

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# Contents

## **Part I Introduction (Surveillance, Microbes and Pathways, Tracing and Preventing)**

<b>1</b>	<b>Patient Protection Is Patient Safety</b> . . . . .	3
1.1	Lack of Leader Competence and Responsibility . . . . .	4
1.2	Hospital Organization Is Important for Hospital Infections and Patient Safety . . . . .	5
1.3	A Future for Healthcare . . . . .	10
	References. . . . .	10
<b>2</b>	<b>Hospital Infections: Surveillance</b> . . . . .	13
2.1	Prevalence and Incidence Surveillance of HAI . . . . .	13
2.2	Effect of Registration . . . . .	15
2.3	The Burden of Healthcare-Associated Infections . . . . .	18
	References. . . . .	20
<b>3</b>	<b>Microbes, Transmission Routes and Survival Outside the Body</b> . . . . .	23
3.1	Microbes are Mostly Normal, Nonpathogenic Flora . . . . .	23
3.2	Pathogenic Microbes: New and Old . . . . .	24
3.3	Transmission Routes: Spread of Infection . . . . .	24
	References. . . . .	27
<b>4</b>	<b>Antibacterial Agents and Drug Resistance</b> . . . . .	29
4.1	Antimicrobials: Sensitivity and Resistance . . . . .	30
4.2	Reasons for Resistance Development . . . . .	31
4.3	Multidrug-Resistant Organisms (MDRO) Are Worldwide Problems . . . . .	33
4.4	Practical Measures . . . . .	35
	References. . . . .	40
<b>5</b>	<b>Tracing and Preventing Infections</b> . . . . .	45
5.1	Purpose. . . . .	45
5.2	Comprise . . . . .	46
5.3	Responsibility . . . . .	46
5.4	Practical Measures . . . . .	46
5.5	Background Information . . . . .	54

5.6 Notification and Warning on Suspected Infection and Dissemination . . . . .	58
References. . . . .	59

## **Part II Infection Control for Health Care Workers**

<b>6 Staff Uniforms and Uniform Policy . . . . .</b>	<b>65</b>
6.1 Purpose. . . . .	65
6.2 Comprise . . . . .	66
6.3 Responsibility . . . . .	66
6.4 Practical Measures . . . . .	66
6.5 Background Information . . . . .	67
References. . . . .	69
<b>7 Vaccination and Control of Employees . . . . .</b>	<b>71</b>
7.1 Purpose. . . . .	71
7.2 Comprise . . . . .	71
7.3 Responsibility . . . . .	72
7.4 Practical Measures . . . . .	72
7.5 Hepatitis A/B vaccines . . . . .	72
7.6 Polio Vaccine . . . . .	73
7.7 Influenza Vaccine . . . . .	73
7.8 Rubella Vaccine . . . . .	74
7.9 Varicella Zoster Vaccine. . . . .	75
7.10 Mumps Vaccine . . . . .	75
7.11 Measles Vaccine . . . . .	75
7.12 Other Viral Vaccines. . . . .	75
7.13 Diphtheria and Tetanus Vaccines: Duo-Vaccines—Optionally Including Pertussis (Tdap) . . . . .	75
7.14 Pertussis Vaccine . . . . .	76
7.15 Pneumococcal Vaccines . . . . .	76
7.16 <i>Haemophilus Influenzae</i> Type B Vaccine. . . . .	77
7.17 Meningococcal Vaccines . . . . .	77
7.18 BCG Vaccination . . . . .	77
7.19 Other Bacterial Vaccines . . . . .	78
7.20 Vaccine Combinations to Children . . . . .	78
References. . . . .	78
<b>8 Employees with Infections or Carrier Status . . . . .</b>	<b>79</b>
8.1 Purpose. . . . .	79
8.2 Comprise . . . . .	79
8.3 Responsibility . . . . .	80
8.4 Practical Measures . . . . .	80
8.5 Background Information . . . . .	80
8.6 Actual Infections or Carrier State . . . . .	81
References. . . . .	85

<b>9</b>	<b>Pregnant Employee Exposed to Infection</b> .....	87
9.1	Purpose.....	87
9.2	Comprise .....	87
9.3	Responsibility .....	88
9.4	Practical Measures.....	88
9.5	Basic Information.....	89
	References.....	89
<b>10</b>	<b>Tuberculosis: Prevention</b> .....	91
10.1	Purpose.....	91
10.2	Comprise .....	91
10.3	Responsibility .....	92
10.4	Practical Measures.....	92
10.5	Basic Information.....	94
	References.....	94
<b>11</b>	<b>Accidents with Blood or Tissue</b> .....	97
11.1	Purpose.....	97
11.2	Comprise .....	98
11.3	Responsibility .....	98
11.4	Practical Measures.....	98
11.5	Background Information .....	104
11.6	Occupation-Associated Blood-Borne Infection and Disease. ....	106
	References.....	107
<b>12</b>	<b>Hand Hygiene and Glove Use</b> .....	111
12.1	Purpose.....	111
12.2	Comprise .....	112
12.3	Responsibility .....	112
12.4	Practical Measures.....	112
12.5	Background Information .....	119
	References.....	125
<b>13</b>	<b>Protection of Upper Respiratory Tract, Mouth and Eyes</b> .....	129
13.1	Purpose.....	129
13.2	Comprise .....	129
13.3	Responsibility .....	130
13.4	Practical Measures.....	130
13.5	Background Information .....	135
13.6	Conclusion.....	143
	References.....	143
 <b>Part III Isolation</b>		
<b>14</b>	<b>Microbes, Transmission and Protection</b> .....	149
14.1	Isolation at Risk of Spread of Infection.....	149

---

<b>15</b>	<b>General Information</b> .....	153
15.1	Purpose .....	153
15.2	Comprise .....	154
15.3	Responsibility .....	154
15.4	Practical Measures .....	154
15.5	Background Information .....	163
	References .....	163
<b>16</b>	<b>Contact Isolation</b> .....	167
16.1	Purpose .....	167
16.2	Comprise .....	167
16.3	Responsibility .....	168
16.4	Practical Measures .....	168
16.5	Background Information .....	176
	References .....	176
<b>17</b>	<b>Blood-Borne Pathogens</b> .....	179
17.1	Purpose .....	179
17.2	Comprise .....	179
17.3	Responsibility .....	180
17.4	Practical Measures .....	180
17.5	Background Information .....	184
	References .....	184
<b>18</b>	<b>Airborne/Droplet Infection Isolation</b> .....	187
18.1	Purpose .....	187
18.2	Comprise .....	188
18.3	Responsibility .....	188
18.4	Practical Measures .....	188
18.5	Background Information .....	195
	References .....	195
<b>19</b>	<b>Strict Isolation</b> .....	197
19.1	Purpose .....	197
19.2	Comprise .....	198
19.3	Responsibility .....	198
19.4	Practical Measures .....	198
19.5	Background Information .....	199
19.6	Strict Isolation Unit .....	199
	References .....	209
<b>20</b>	<b>Protective Isolation</b> .....	213
20.1	Purpose .....	213
20.2	Comprise .....	214
20.3	Responsibility .....	214
20.4	Protective Isolation .....	214
20.5	Background Information .....	214
20.6	Practical Measures .....	214
	References .....	221

**21 Background Information: Isolation Routines** . . . . . 223

21.1 Isolation . . . . . 223

21.2 History . . . . . 223

21.3 Hospital Infections that Should Be Treated in Isolates . . . . . 225

21.4 New and Old Microbes Increase the Need for Isolates . . . . . 225

21.5 Particular Issues Around Infection and Isolation . . . . . 226

21.6 Lack of Infection Isolates . . . . . 226

21.7 Administrative Responsibility for Isolation Treatment . . . . . 233

21.8 Contact Isolation: “Contact Precautions” (CP) . . . . . 235

21.9 Airborne and Droplets: Isolation . . . . . 237

21.10 Strict Isolation for High-Risk and Dangerous Pathogens . . . . . 240

21.11 Protective Isolation . . . . . 240

21.12 Protecting Staff Against Serious Infection . . . . . 242

21.13 CDC Isolation Guidelines - Overview - Selected by the Author . . . . . 244

References . . . . . 246

**Part IV Patient Care**

**22 Personal Hygiene and Care of Patients** . . . . . 255

22.1 Purpose . . . . . 255

22.2 Comprise . . . . . 255

22.3 Responsibility . . . . . 256

22.4 Practical Measures . . . . . 256

22.5 Background Information . . . . . 259

References . . . . . 263

**23 Oral Hygiene** . . . . . 265

23.1 Purpose . . . . . 265

23.2 Comprise . . . . . 265

23.3 Responsibility . . . . . 266

23.4 Practical Measures . . . . . 266

23.5 Background Information . . . . . 269

References . . . . . 271

**24 Wound Care: Skin and Soft Tissue** . . . . . 273

24.1 Purpose . . . . . 273

24.2 Comprise . . . . . 274

24.3 Responsibility . . . . . 274

24.4 Practical Measures . . . . . 274

24.5 Background Information . . . . . 275

References . . . . . 276

**25 Prevention of Infected Pressure Sores** . . . . . 279

25.1 Purpose . . . . . 279

25.2 Comprise . . . . . 280

25.3 Responsibility . . . . . 280

25.4 Practical Measures . . . . . 280

25.5 Background Information . . . . . 282

References . . . . . 284

## Part V Respiratory Infections

<b>26</b>	<b>Prevention of Respiratory Infections</b> .....	289
26.1	Purpose.....	289
26.2	Comprise .....	290
26.3	Responsibility .....	290
26.4	Practical Measures.....	290
26.5	Background Information .....	293
26.6	Important Microbial Causes of Pneumonia.....	297
26.7	Ventilator-Treated Patients and VAP .....	304
	References.....	307
<b>27</b>	<b>Chest Physiotherapy and Mobilization: Postoperatively</b> .....	313
27.1	Purpose.....	313
27.2	Comprise .....	314
27.3	Responsibility .....	314
27.4	Practical Measures.....	314
27.5	Background Information .....	316
	References.....	319
<b>28</b>	<b>Suction of Respiratory Tract Secretions</b> .....	323
28.1	Purpose.....	323
28.2	Comprise .....	323
28.3	Responsibility .....	324
28.4	Practical Measures.....	324
28.5	Background Information .....	327
	References.....	330
<b>29</b>	<b>Care of the Ventilator Patient and Equipment</b> .....	333
29.1	Purpose.....	333
29.2	Comprise .....	333
29.3	Responsibility .....	334
29.4	Practical Measures.....	334
29.5	Background Information .....	338
	References.....	342
<b>30</b>	<b>Respirator and Anaesthesia Equipment</b> .....	345
30.1	Purpose.....	345
30.2	Comprise .....	346
30.3	Responsibility .....	346
30.4	Practical Measures.....	346
30.5	Background Information .....	349
	References.....	351
<b>31</b>	<b>Respirator in Intensive Treatment</b> .....	355
31.1	Purpose.....	355
31.2	Comprise .....	356
31.3	Responsibility .....	356

31.4	Practical Measures . . . . .	356
31.5	Background Information . . . . .	358
	References. . . . .	361
<b>32</b>	<b>External CPAP: Cleaning Procedures . . . . .</b>	<b>365</b>
32.1	Purpose. . . . .	365
32.2	Comprise . . . . .	366
32.3	Responsibility . . . . .	366
32.4	Practical Measures. . . . .	366
32.5	Background Information . . . . .	368
	References. . . . .	371
 <b>Part VI Surgery</b>		
<b>33</b>	<b>Prevention of Postoperative Wound Infections . . . . .</b>	<b>377</b>
33.1	Purpose. . . . .	377
33.2	Comprise . . . . .	378
33.3	Responsibility . . . . .	378
33.4	Practical Measures. . . . .	378
33.5	Background Information . . . . .	389
	References. . . . .	423
<b>34</b>	<b>Surgical Hand Disinfection . . . . .</b>	<b>439</b>
34.1	Purpose. . . . .	439
34.2	Comprise . . . . .	440
34.3	Responsibility . . . . .	440
34.4	Practical Measures. . . . .	440
34.5	Background Information . . . . .	443
	References. . . . .	450
<b>35</b>	<b>Operation Department: Infection Control . . . . .</b>	<b>453</b>
35.1	Purpose. . . . .	454
35.2	Comprise . . . . .	454
35.3	Responsibility . . . . .	454
35.4	Practical Measures. . . . .	454
35.5	Background Information . . . . .	477
	References. . . . .	485
<b>36</b>	<b>Newly Operated Patient . . . . .</b>	<b>491</b>
36.1	Purpose. . . . .	491
36.2	Comprise . . . . .	491
36.3	Responsibility . . . . .	491
36.4	Practical Measures. . . . .	492
<b>37</b>	<b>Care of Wound Drainages . . . . .</b>	<b>495</b>
37.1	Purpose. . . . .	495
37.2	Comprise . . . . .	495
37.3	Responsibility . . . . .	495

37.4	Practical Measures . . . . .	496
37.5	Background Information . . . . .	499
	References. . . . .	499
 <b>Part VII Dialysis</b>		
<b>38</b>	<b>Peritoneal Dialysis (PD) and Diagnostic Peritoneal Lavage . . . . .</b>	<b>503</b>
38.1	Purpose. . . . .	503
38.2	Comprise . . . . .	503
38.3	Responsibility . . . . .	503
38.4	Practical Measures. . . . .	504
38.5	Background Information . . . . .	507
	References. . . . .	510
<b>39</b>	<b>Haemodialysis (HD) . . . . .</b>	<b>513</b>
39.1	Purpose. . . . .	513
39.2	Comprise . . . . .	513
39.3	Responsibility . . . . .	514
39.4	Practical Measures. . . . .	514
39.5	HD Performed as Self-Dialysis Under Surveillance . . . . .	521
39.6	Background Information . . . . .	523
39.7	Summary of Practical Guidelines from The Renal Association for Haemodialysis . . . . .	530
	References. . . . .	531
 <b>Part VIII Bloodstream Infections</b>		
<b>40</b>	<b>Peripheral Intravenous Catheters . . . . .</b>	<b>535</b>
40.1	Introduction (BI) . . . . .	535
40.2	Peripheral Intravenous Catheter. . . . .	536
40.3	Purpose. . . . .	536
40.4	Comprise . . . . .	536
40.5	Responsibility . . . . .	536
40.6	Practical Measures. . . . .	537
40.7	Background Information . . . . .	542
	References. . . . .	544
<b>41</b>	<b>Central Intravascular Catheter (CVC). . . . .</b>	<b>547</b>
41.1	Purpose. . . . .	548
41.2	Comprise . . . . .	548
41.3	Responsibility . . . . .	548
41.4	Practical Measures. . . . .	548
41.5	Background Information . . . . .	555
	References. . . . .	565
<b>42</b>	<b>Central Implanted Venous Access Port. . . . .</b>	<b>569</b>
42.1	Purpose. . . . .	569
42.2	Comprise . . . . .	570

42.3	Responsibility .....	570
42.4	Practical Measures .....	570
42.5	Background Information .....	577
	References .....	579

**Part IX Special Patient Groups**

<b>43</b>	<b>Urinary Tract Infections: Prevention</b> .....	583
43.1	Purpose .....	583
43.2	Comprise .....	583
43.3	Responsibility .....	584
43.4	Practical Measures .....	584
43.5	Background Information .....	597
	References .....	606
<b>44</b>	<b>Premature and New-Borns</b> .....	611
44.1	Purpose .....	611
44.2	Comprise .....	611
44.3	Responsibility .....	612
44.4	Practical Measures .....	612
44.5	Background Information .....	624
	References .....	627
<b>45</b>	<b>Intensive Patient Treatment</b> .....	631
45.1	Purpose .....	631
45.2	Comprise .....	632
45.3	Responsibility .....	632
45.4	Practical Measures .....	632
45.5	Background Information .....	635
	References .....	641
<b>46</b>	<b>Cystic Fibrosis: Infections and Prevention</b> .....	645
46.1	Purpose .....	645
46.2	Comprise .....	646
46.3	Responsibility .....	646
46.4	Practical Measures .....	646
46.5	Background Information .....	655
	References .....	658

**Part X Special Infections: Prevention**

<b>47</b>	<b>Admittance to Hospital</b> .....	663
47.1	Purpose .....	664
47.2	Comprise .....	664
47.3	Responsibility .....	664
47.4	Practical Measures .....	664
47.5	Background Information .....	671
	References .....	673

---

<b>48</b>	<b>Healthcare Professionals</b> .....	677
48.1	Purpose .....	677
48.2	Comprise .....	678
48.3	Responsibility .....	678
48.4	Practical Measures .....	678
48.5	Background Information .....	679
	References .....	679
<b>49</b>	<b>MRSA Prevention</b> .....	681
49.1	Purpose .....	682
49.2	Comprise .....	682
49.3	Responsibility .....	682
49.4	Practical Measures .....	682
49.5	Background Information .....	697
	References .....	705
<b>50</b>	<b>Vancomycin-Resistant Enterococci Prevention</b> .....	713
50.1	Purpose .....	713
50.2	Comprise .....	714
50.3	Responsibility .....	714
50.4	Practical Measures .....	714
50.5	Background Information .....	718
	References .....	724
<b>51</b>	<b>Multidrug-Resistant Gram-Negative Rods</b> .....	729
51.1	Purpose .....	730
51.2	Comprise .....	730
51.3	Responsibility .....	730
51.4	Practical Measures .....	730
51.5	Background Information .....	735
51.6	Remember! .....	740
	References .....	740
<b>52</b>	<b>Gastrointestinal Infections</b> .....	745
52.1	Purpose .....	746
52.2	Comprise .....	746
52.3	Responsibility .....	746
52.4	Practical Measures .....	746
52.5	Background Information .....	750
	References .....	753
<b>53</b>	<b><i>Clostridium difficile</i></b> .....	755
53.1	Purpose .....	756
53.2	Comprise .....	756
53.3	Responsibility .....	756
53.4	Practical Measures .....	756
53.5	Background Information .....	760
	References .....	762

<b>54</b>	<b>Norovirus and Other Viral Gastroenteritis</b> .....	765
54.1	Purpose.....	765
54.2	Comprise .....	766
54.3	Responsibility .....	766
54.4	Practical Measures.....	766
54.5	Background Information .....	769
54.6	Norovirus .....	769
54.7	Rotavirus .....	772
	References.....	772
<b>55</b>	<b>Prion Diseases: Infection Protection</b> .....	775
55.1	Purpose.....	775
55.2	Comprise .....	776
55.3	Responsibility .....	776
55.4	Practical Measures.....	776
55.5	Background Information .....	778
55.6	New Prion Diseases .....	780
	References.....	780
<b>56</b>	<b>Tuberculosis: Control in Hospitals</b> .....	783
56.1	Purpose.....	784
56.2	Comprise .....	784
56.3	Responsibility .....	784
56.4	Practical Measures.....	784
56.5	Background Information .....	788
	References.....	797
<b>57</b>	<b>Scabies: Control in Hospitals</b> .....	799
57.1	Purpose.....	799
57.2	Comprise .....	800
57.3	Responsibility .....	800
57.4	Practical Measures.....	800
57.5	Background Information .....	801
	References.....	805

**Part XI Disinfection, Sterilization, Cleaning, Control**

<b>58</b>	<b>Disinfection of Skin and Mucous Membranes</b> .....	809
58.1	Purpose.....	809
58.2	Comprise .....	810
58.3	Responsibility .....	810
58.4	Practical Measures.....	810
58.5	Background Information .....	812
	References.....	812
<b>59</b>	<b>Disinfection of Instruments and Equipment</b> .....	815
59.1	Purpose.....	815
59.2	Comprise .....	815

---

59.3	Responsibility . . . . .	816
59.4	Practical Measures . . . . .	816
59.5	Prion Inactivation: Prion Diseases . . . . .	826
59.6	Background Information . . . . .	827
	References. . . . .	831
<b>60</b>	<b>Endoscopes and Other Special Equipment. . . . .</b>	<b>835</b>
60.1	Purpose. . . . .	835
60.2	Comprise . . . . .	836
60.3	Responsibility . . . . .	836
60.4	Practical Measures . . . . .	836
60.5	Background Information . . . . .	843
	References. . . . .	846
<b>61</b>	<b>Sterilization . . . . .</b>	<b>849</b>
61.1	Purpose. . . . .	849
61.2	Comprise . . . . .	850
61.3	Responsibility . . . . .	850
61.4	Practical Measures . . . . .	850
61.5	Background Information . . . . .	855
	References. . . . .	858
<b>62</b>	<b>Sterilization: Control and Quality . . . . .</b>	<b>859</b>
62.1	Purpose. . . . .	859
62.2	Comprise . . . . .	859
62.3	Responsibility . . . . .	860
62.4	Practical Measures . . . . .	860
62.5	Background Information . . . . .	861
	References. . . . .	862
<b>63</b>	<b>Sterile and Clean Equipment: Storage . . . . .</b>	<b>863</b>
63.1	Purpose. . . . .	863
63.2	Comprise . . . . .	864
63.3	Responsibility . . . . .	864
63.4	Practical Measures . . . . .	864
63.5	Background Information . . . . .	867
	References. . . . .	868
<b>64</b>	<b>Medicine Storage and Preparation Room . . . . .</b>	<b>871</b>
64.1	Purpose. . . . .	871
64.2	Comprise . . . . .	872
64.3	Responsibility . . . . .	872
64.4	Practical Measures . . . . .	872
64.5	Background Information . . . . .	878
	References. . . . .	879

**Part XII Internal Service**

<b>65</b>	<b>Cleaning of Rooms in Wards</b> .....	883
65.1	Purpose .....	883
65.2	Comprise .....	884
65.3	Responsibility .....	884
65.4	Practical Measures .....	884
65.5	Background Information .....	890
	References .....	893
<b>66</b>	<b>Disinfection of Rooms and Surfaces</b> .....	897
66.1	Purpose .....	897
66.2	Comprise .....	897
66.3	Responsibility .....	898
66.4	Practical Measures .....	898
66.5	Background Information .....	901
	References .....	902
<b>67</b>	<b>Hospital Textiles</b> .....	907
67.1	Purpose .....	907
67.2	Comprise .....	908
67.3	Responsibility .....	908
67.4	Practical Measures .....	908
67.5	Background Information .....	914
	References .....	915
<b>68</b>	<b>Patient Beds</b> .....	919
68.1	Purpose .....	919
68.2	Comprise .....	919
68.3	Responsibility .....	920
68.4	Practical Measures .....	920
68.5	Background Information .....	921
	References .....	922
<b>69</b>	<b>Hospital Waste</b> .....	923
69.1	Purpose .....	923
69.2	Comprise .....	923
69.3	Responsibility .....	924
69.4	Practical Measures .....	924
69.5	Background Information .....	926
	References .....	928
<b>70</b>	<b>Food and Beverages</b> .....	929
70.1	Purpose .....	929
70.2	Comprise .....	929
70.3	Responsibility .....	930
70.4	Practical Measures .....	930
70.5	Background Information .....	934
	References .....	941

**71 Water and Water Systems in Hospitals** . . . . . 943

71.1 Purpose . . . . . 943

71.2 Comprise . . . . . 944

71.3 Responsibility . . . . . 944

71.4 Practical Measures . . . . . 944

71.5 Background Information . . . . . 947

References . . . . . 949

**72 Technical and Medical Technical Equipment** . . . . . 953

72.1 Purpose . . . . . 953

72.2 Comprise . . . . . 953

72.3 Responsibility . . . . . 954

72.4 Practical Measures . . . . . 954

72.5 Background Information . . . . . 957

References . . . . . 957

**73 Laboratories** . . . . . 959

73.1 Purpose . . . . . 959

73.2 Comprise . . . . . 959

73.3 Responsibility . . . . . 960

73.4 Practical Measures . . . . . 960

73.5 Background Information . . . . . 964

References . . . . . 967

**74 Transport in Hospitals** . . . . . 969

74.1 Purpose . . . . . 969

74.2 Comprise . . . . . 969

74.3 Responsibility . . . . . 969

74.4 Practical Measures . . . . . 970

References . . . . . 971

**75 Ambulances, Emergency Medical Service (EMS) and Other Transports of Patients** . . . . . 973

75.1 Purpose . . . . . 973

75.2 Comprise . . . . . 974

75.3 Responsibility . . . . . 974

75.4 Practical Measures . . . . . 974

75.5 Background Information . . . . . 980

References . . . . . 982

**Part XIII Hospitals: Areal and Function**

**76 Hospital Buildings—Construction Projects** . . . . . 987

76.1 Purpose . . . . . 987

76.2 Comprise . . . . . 988

76.3 Responsibility . . . . . 988

76.4 Practical Measures . . . . . 988

76.5 Background Information . . . . . 991

References . . . . . 993

<b>77</b>	<b>Hospital Kitchen</b> .....	995
	77.1 Purpose .....	995
	77.2 Comprise .....	995
	77.3 Responsibility .....	996
	77.4 Practical Measures .....	996
	77.5 Background Information .....	998
	References .....	998
<b>78</b>	<b>Disinfection Room: Cleaning Room</b> .....	1001
	78.1 Purpose .....	1001
	78.2 Comprise .....	1001
	78.3 Responsibility .....	1002
	78.4 Practical Measures .....	1002
	78.5 Background Information .....	1003
	References .....	1004
<b>79</b>	<b>Internal Infection Control: Checklist</b> .....	1007
	79.1 Purpose .....	1007
	79.2 Comprise .....	1007
	79.3 Responsibility .....	1007
	79.4 Practical Measures .....	1008
	79.5 Background Information .....	1016
 <b>Part XIV High-Risk Microbes</b>		
<b>80</b>	<b>Dangerous Microbes</b> .....	1021
	80.1 Dangerous Microbes .....	1021
	References .....	1027
<b>81</b>	<b>Emergency Preparedness</b> .....	1029
	81.1 Purpose .....	1029
	81.2 Comprise .....	1029
	81.3 Responsibility .....	1030
	81.4 Practical Measures .....	1030
	References .....	1034
<b>82</b>	<b>Scenarios: Serious, Infectious Diseases</b> .....	1039
	82.1 Purpose .....	1039
	82.2 Comprise .....	1040
	82.3 Responsibility .....	1040
	82.4 Practical Measures .....	1040
	82.5 Scenarios .....	1041
	References .....	1049
<b>83</b>	<b>Isolation: Serious, Infectious Diseases</b> .....	1053
	83.1 Purpose .....	1053
	83.2 Comprise .....	1053
	83.3 Responsibility .....	1054
	83.4 Practical Measures .....	1054
	References .....	1060

---

<b>84</b>	<b>Personal Protective Equipment (PPE)</b> .....	1061
84.1	Purpose .....	1061
84.2	Comprise .....	1061
84.3	Responsibility .....	1062
84.4	Practical Measures .....	1062
84.5	Emergency Preparedness Stocks .....	1063
	References .....	1064
<b>85</b>	<b>Communication, Information and Advice</b> .....	1065
85.1	Purpose .....	1065
85.2	Comprise .....	1065
85.3	Responsibility .....	1066
85.4	Practical Measures .....	1066
	References .....	1067
<b>86</b>	<b>Triage: Serious Infections</b> .....	1069
86.1	Purpose .....	1069
86.2	Comprise .....	1069
86.3	Responsibility .....	1070
86.4	Practical Measures .....	1070
	References .....	1071
<b>87</b>	<b>Patient Management: Logistic</b> .....	1073
87.1	Purpose .....	1073
87.2	Comprise .....	1073
87.3	Responsibility .....	1074
87.4	Practical Measures .....	1074
	References .....	1075
<b>88</b>	<b>Viral Haemorrhagic Fever (VHF) and Other Serious Viral Infections</b> .....	1077
88.1	Purpose .....	1078
88.2	Comprise .....	1078
88.3	Responsibility .....	1078
88.4	Practical Measures .....	1079
88.5	Background Information .....	1084
88.6	Lack of Infection Control Routines .....	1087
	References .....	1090
<b>89</b>	<b>Biological Terror: Anthrax-Suspected</b> .....	1093
89.1	Purpose .....	1094
89.2	Comprise .....	1094
89.3	Responsibility .....	1094
89.4	Practical Measures .....	1094
89.5	Background Information .....	1097
	References .....	1097

---

<b>90</b>	<b>Preparedness in Connection with Biological Weapons</b> . . . . .	1099
90.1	Purpose. . . . .	1099
90.2	Comprise . . . . .	1099
90.3	Responsibility . . . . .	1100
90.4	Practical Measures for Treatment of Suspected Mail: During Threats . . . . .	1100
	Reference . . . . .	1101
<b>91</b>	<b>Dangerous Infectious Agents Combined with Hazardous Chemicals.</b> . . . . .	1103
91.1	Purpose. . . . .	1103
91.2	Comprise . . . . .	1104
91.3	Responsibility . . . . .	1104
91.4	Practical Measures . . . . .	1104
	References. . . . .	1107
<b>92</b>	<b>Infection Control Resources.</b> . . . . .	1109
92.1	Purpose. . . . .	1110
92.2	Comprise . . . . .	1110
92.3	Responsibility . . . . .	1110
92.4	Background Information . . . . .	1117
	References. . . . .	1119
	<b>Definitions</b> . . . . .	1123
	References. . . . .	1127

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## Part I

# Introduction (Surveillance, Microbes and Pathways, Tracing and Preventing)



# Patient Protection Is Patient Safety

1

## Abstract

Patient safety is dependent on the quality of care, treatment and protection against adverse events. Healthcare personnel should do their work in a good, safe and effective way. Hospital leaders have the responsibility to protect all patients against adverse events, like hospital infections, and ensure that hospital resources are sufficient.

## Keywords

Healthcare-associated infections · HAI · Hospital infections · Patient safety  
Overcrowding · Understaffing · Bed occupancy · Hygienic measures · Infection control · Leadership · Administration · Organization · Health resources

Lack of patient safety and protection in hospitals may result in adverse events and injuries. Hospital-associated infections (HAIs) cause more than 90% of all these adverse events [1, 2]. In US hospitals, it is estimated that more than 110,000 patients (ca. 37 million admissions) die from medical failures each year; and 99,000 of these deaths are attributed to HAIs [2, 3]. In Europe, HAIs may cause 37,000 attributable deaths, and contribute an additional 110,000 every year [1, 3]. It is estimated that HAIs may cost up to 16 million extra days in European hospitals each year [1, 3].

Patient safety is dependent on knowledge and skill of the personnel, proper use of guidelines, political choices and priorities, healthcare resources and a competent management.

Conditions associated with adverse events like HAIs are as follows: overcrowding of patients, high bed occupancy rates (more than 85%), too many beds in one room (single-bed room becomes two-bed room), corridor patients, transferring patients to another department that does not have the “right” speciality, too early discharges because of shortage of patient beds, understaffing, inadequate monitoring of sick patients and lack of hygiene and cleanliness. These are