



# References

---

## REFERENCES

- Abbott, S.L.; Hanson, D.F. and Felland, T.D. (1994):* "Escherichia coli 0157:H7 generates a unique biochemical profile on Microscan conventional gram negative identification panels". J. Clin. Microbiol. Mar., 32(3): 823-4.
- Ahmed, Y.; Tawfik, N.; El-Feky, M.; Tohamy, M. and Essam, O. (1993):* "Nosocomial infections in Assiut University Hospital". Egyptian J. Med. Microbiol., 2(2): 157-162.
- Albertson, G.D.; Niimi, M. and Cannon, R.D. (1996):* "Multiple efflux mechanisms are involved in Candida albicans fluconazole resistance". Antimicrob. Agents Chemother., 40: 2835-41.
- Alexander, B.D. and Perfect, J.R. (1997):* "Antifungal resistance trends towards the year 2000: Implications for therapy and new approaches". Drugs, 54: 657-678.
- Almeida, R.J.; Jorgensen, J.H. and Johnson, J.E. (1983):* "Evaluation of the Automicrobic system gram positive identification card for species identification of Coagulase negative staphylococci". J. Clin. Microbiol., 18: 438.
- Amyes, C.G.B. and Gemmell, C.G. (1997):* "Antibiotic resistance: a view article". J. Med. Microbiol., 46: 436-470.
- Applebaum, P.C. (1992):* "Antimicrobial resistance in Streptococcus pneumoniae: an overview". Clin. Infect. Dis., 15:77-83.
- Arbeit, R.D. (1995):* "Laboratory procedures for epidemiologic analysis of micro-organisms". In: Manual of Clinical Microbiology Sixth Edition Ed. Murray, P.R., Baron, E.J., Pfaller, M.A., Tenover, F.C and Tenover, R.H. P. 190-208. Washington, D.C.: American Society for Microbiology.
- Arthur, M. and Courvalin, P. (1993):* "Genetics and mechanisms of glycopeptide resistance in enterococci". Antimicrob. Agents Chemother., 37: 1563-1571.

- Ayliffe, G.A.J. (1991):* "Role of the environment of the operating suite in surgical wound infections". *Rev. Infect. Dis.*, 13 (Suppl. 10) s800-s804.
- Ayliffe, G.A.J. (1997):* "The progressive intercontinental spread of methicillin resistant *Staphylococcus aureus*". *Clin. Infect. Dis.*, 24 (Suppl.): S74-9.
- Banerjee, S.N.; Emori, T.G.; Culver, D.H. et al. (1991):* "Secular trends in nosocomial primary blood stream infections in the US, 1980-89". *NNISS Am. J. Med.*, 91: 86S-89S.
- Baron, E.J. and Finegold, S.M. (1994) :* "Different microbiological methods for identification of bacteria" in Bailey and Scott's – Diagnostic Microbiology, 9<sup>th</sup> Edition. Mosby. Louis, Baltimore, Boston.
- Barrett, F.F.; McGehee, R.F.Jr. and Finalnd, M. (1968):* "MRSA at Boston City Hospital. Bacteriologic and epidemiologic observations". *N. Engl. J. Med.*, 279: 441-8.
- Bates, J.; Jorens, J.Z. and Griffiths, D.T. (1994):* "Farm animals as a putative reservoir for vancomycin resistant enterococcus infection in man". *J. Antimicrob. Chemother.*, 34: 5007-516.
- Bauer, A.W.; Kirby, W.M.M. and Sherris, J.C. (1966):* "Antibiotic susceptibility testing by a single disc method". *Am. J. Clin. Pathol.*, 45: 493-496.
- Bell, J.M.; Turnidge, A.C.; Gales, M.A. and Pfaller, R.N. (2002):* "Prevalence of extended spectrum B lactamase (ESBL). Producing clinical isolates in the Asia-Pacific region and South Africa; regional results from Sentry Antimicrobial Surveillance Program". *Diagnostic Microbiology and Infectious Disease*, 42: 193-198.
- Bergogne-Berezen, E. and Towner, K.J. (1996):* "Acinitobacter species as nosocomial pathogens: microbiological, clinical and epidemiological feature". *Clin. Microbiol. Rev.*, 9: 148-65.
- Bernstein, D.I.; Glass, R.I.; Rodgers, G. et al. (1995):* U.S. Rotavirus Vaccine Efficacy Group. Evaluation of rhesus rotavirus monovalent and tetravalent reassortant vaccines in US children. *JAMA*, 273: 1191-1196.

- Bezason, G.J.; MacDonald and Derbot, M. (1995):* "Polymorphism in ribosome spacer DNA amplicons permit differentiation of MRSA". Abst. J. 145. P. 283. In: Program and abstracts of the 35<sup>th</sup> Interscience Conference on Antimicrobial Agents and Chemotherapy, American Society for Microbiology, Washington, DC.
- Blondeau, J.M.; Ashton, F.E.; Isaacson, M.; Yaschuck, Y. and Anderson, C. (1995):* "Neisseria meningitides with decreased susceptibility to penicillin in Saskatchewan, Canada". J. Clin. Microbiol., 33: 1784-1786.
- Bonten, M.J.; Hayden, M.K.; Nathan, C.; Voorhis, J.F.; Matushek, M.; Slaughter, S.; Rice, T. and Weinstein, R.A. (1996):* "Epidemiology of colonization of patients and environment with vancomycin resistant enterococci". Lancet, 348:1615-9.
- Boyce, J.M. (1990):* "Increasing prevalence of methicillin resistant Staphylococcus aureus in the United States". Infect. Control Hosp. Epidemiol., 11: 639-642.
- Boyce, J.M.; Jackson, M.M.; Pugliese, G. et al. (1994a):* "Methicillin-resistant Staphylococcus aureus a briefing for acute care hospitals and nursing facilities". Infect. Cont. Hosp. Epidemiol., 15: 105-115.
- Boyce, J.M.; Opal, S.M. and Chow, J.W. (1994b):* "Outbreak of multidrug resistant Enterococcus faecium with transferable van B class vancomycin resistance". J. Clin. Microbiol., 32: 1148-53.
- Boyce, J.M.; Mermel, L. and Zevos, M.J. (1995):* "Controlling vancomycin resistant enterococci". Infect. Control Hosp. Epidemiol., 16: 634-637.
- Brachman, P.S. (1986):* "Epidemiology of nosocomial infections". In: Hospital Infections Second Edition. Ed. Bennett, J.V. and Brachman, P.S. Boston, Little, Brown & Co.
- Breiman, R.F.; Battler, J.C. and Tenover, F.C. (1994):* "Emergence of drug resistant pneumococcal infections in the U.S." J. Am. Med. Assoc., 271: 1831-1835.

- Brooks, R.G. and Remington, J.S. (1986):* "Transplant- related infections". In: Bennett, J.V., and Brachman, P.S., editors: Hospital infections ed. 2, Boston, Little, Brown & Co.
- Brossette, S.E.; Sprague, A.P.; Hardin, J.M. and Waites, K.B. (1998):* "Association rules and data mining in hospital infection control and public health surveillance". J. Am. Med. Inform. Assoc. Jul-Aug., 5(4): 373-81.
- Carter, M.W.; Oakton, K.J. and Warner, M. (2000):* "Detection of extended spectrum beta-lactamases in klebsiellae with the oxoid combination disk method". J. Clin. Microbiol., 2000 Nov., 38(11): 4228-32.
- Catchpole, C. and Hastings, J.G.M. (1995):* "Measuring pre and post-dose vancomycin levels-time for change". J. Med. Microbiol., 45: 304-311.
- Caveaghi, L.A.; Biganzoli, E.; Donese, A. and Parenti, F. (1992):* "Diffusion of teicoplanin and vancomycin in agar". Diag. Microbiol. Infect. Dis., 15: 253-258.
- Centers for Disease Control and Prevention Working Group (1981):* Guidelines for prevention of intravenous therapy-related infections. Infect Control 3 : 62 – 79.
- Centers for Disease Control and Prevention (1985):* "Recommendations for preventing transmission of infection with human T-lymphotropic virus type III/ lymphadenopathy-associated virus in the work place". MMWR, 34: 681-686.
- Centers for Disease Control and Prevention (1993):* "Nosocomial enterococci resistant to vancomycin. United States 1989-1993". Mortal Morb. Wkly Rep., 42: 597-9.
- Centers for Disease Control and Prevention (1995):* "Preventing the spread of vancomycin resistance". United States: Federal Register, 59: 257-263.
- Chambers, C.; Henja, J. and Bradley, B. (1990):* "Comparison of an automated system (Autosceptor) to the manual Sceptor system", Abstr., C-166, P. 371. Abstr. 90<sup>th</sup> Annu. Meet Am. Soc. Microbiol., 1990 American Society for Microbiology Washington, D.C.

- Chen, Y.S.; Marshall, S.A. and Winokur, P.L. (1998):** "Use of molecular and reference susceptibility testing methods in a multicenter evaluation of Microscan dried overnight gram positive MIC panels for detection of vancomycin and high level aminoglycoside resistances in enterococci". J. Clin. Microbiol. Oct., 36(10): 2996-3001.
- Chow, J.W.; Fine, M.J. and Shales, D.M. (1991):** "Enterobacter bacteremia: Clinical features and emergence of antibiotic resistance during therapy". Ann. Intern. Med., 115: 585-90.
- Chung, S.J.; Gosnell, W.O. and Purkey, M.S. (1995):** "Choice of antibiotics by the site of infection in a community hospital". Int. J. Biomed. Comput. Sep., 40(1): 31-9.
- Cienciala, A.; Madry, R. and Barucha, P. (2000):** "Hospital infection in surgical wards". Przegl. Epidemiol., 54(3-4): 291-7.
- Cindy, Van, P.; Cees, M.V.; Wil, H.F.G. and Margreet, C.V. (1999):** "Identification of Burkholderia spp in the clinical microbiology laboratory: comparison of conventional and molecular methods". J. Clin. Microbiol. July, 37(7): 2158-2164.
- Coia, J.E. (1998):** "Nosocomial and laboratory acquired infection and Escherichia coli 0157". J. Hosp. Infect. Oct., 40(2): 107-13.
- Colonna, P.; Nikolai, D. and Bruchner, D. (1990):** "Comparison of Microscan autoScan-Walkaway, Radiometer Sensititre and Vitek systems for rapid identification of gram negative bacilli". Abstr. C. 157 P370 Abstr. 90 Th. Annual Meeting Amer. Soc. Microbiol. Amer. Soc. Washington, DC.
- Cormican, M.G. and Pfaller, M.A. (1996):** "Molecular Pathology of Infectious Diseases". In: Clinical diagnosis and management by laboratory methods 19<sup>th</sup> ed., Ed. Henry, J.B. P. 1390-9. Philadelphia: W.B. Saunders.
- Coudron, P.E.; Moland, E.S. and Sanders, C.C. (1997):** "Occurrence and detection of extended spectrum  $\beta$  lactamases in members of the family Enterobacteriaceae at a Veterans Medical Center: Seek and you may find". J. Clin. Microbiol., 35: 2593-2597.

- Craven, D.E.; Barber, T.W.; Stager, K.A. and Montecalvo, M.A. (1991):** Nosocomial pneumonia in the 90's : update on epidemiology and risk factors. *Seminars M Resp Infection* 5 : 152-172.
- Cruse, P.J.E. and Foord, R. (1980) :** The epidemiology of wound infections : a 10 year prospective study of 62, 434 wounds surgical clinic of North America, 60; 27-40.
- Cummings, D.M.; Nikolai, D. and Bruckner, D. (1975):** "Radiometric detection of the metabolic activity of mycobacterium tuberculosis". *J. Nucl. Med.*, 16: 1189-1191.
- Cunha, B.A. (1995):** "Vancomycin. Quoted from Antimicrobial therapy II". Cunha BA, *Medical Clinics of North America*, 79; 817-831.
- D'Amato, R.; Isenberg, G. and Baron, R. (1988):** "Novel application of video image processing to biochemical and antimicrobial susceptibility testing". *J. Clin. Microbiol.*, 26: 1492-95.
- D'Aquila, R.; Bechtel, J. and Videler, J. (1991):** "Maximizing sensitivity and specificity of P.C.R by preamplification heating". *Nuclei Acids Res.*, (19): 3749.
- DeJonge, B.; Chang, Y.S.; Gage, D. and Tomasz, A. (1992):** "Peptidoglycan composition of a highly methicillin-resistant *Staphylococcus aureus* strain: the role of PBP2A in MRSA". *J. Biol. Chem.*, 267: 11248-11254.
- Delaney, C.J.; Opheim, K.E. and Smith, A.I. (1982):** "Performance characteristics of bioassay, radio-enzymatic assay, homogenous enzyme immunoassay and high performance liquid chromatography for determination of serum gentamycin". *J. Clin. Microbiol.*, 21: 9.
- DeLencastre, H.; Figueiredo, A.M.S. and Tomasz, A. (1993):** "Genetic control of population structure in heterogenous strains of MRSA". *Eur. J. Clin. Microbiol. Infect. Dis.*, 12, Supl. 1: S13-S18.
- DeLencastre, H.; Figueiredo, A.M.S.; Urban, K.; Rahal, J. and Tomasz, A. (1991):** "Multiple mechanisms of methicillin resistance and improved methods for detection in clinical isolates of *Staphylococcus aureus*". *Antimicrob. Agents Chemother.*, 35: 632-639.

- Dellinger, E.P.; Gross, P.A. and Barrett, T.L. (1994):* "Quality standard for antimicrobial prophylaxis in surgical procedures". Clin. Infect. Dis., 18: 422-7.
- Department of Health (1995):* "Hospital Infection Control-Guidance on the Control of Infection in Hospitals". Prepared by DH/PHLS Hospital Infection Working Party, HMSO, London.
- Department of Health (1996):* Sterilisation, disinfection and cleaning of medical equipment; guidance on decontamination from the microbiology Advisory Committee to Department of Health Medical Devices Directorate. Part II: Protocols, London: Medical Devices Agency.
- Department of Labor, Occupational Safety and Health Administration (1991):* Occupational exposure to blood borne pathogens: Final rule, Federal Register, 56: 64175-64182.
- Deva, A.K.; Vickery, K. and West, R.H. (1998):* "Detection of persistent vegetative bacteria and amplified viral nucleic acid from in-use testing of gastrointestinal endoscopes". J. Hosp. Infect., 39(2): 149-57.
- Dieckhaus, K.D. and Cooper, B.W. (1998):* "Infection control concepts in critical care". Crit. Care Clin., 14(1): 55-70.
- Dixon, R.E. (1992):* Investigation of endemic and epidemic infections. In: Bennel JV, Brachman PS eds, Hospital infection. 3<sup>rd</sup> ed., P. 109-133. Boston: Little, Brown and Co.
- Doern, G.V.; Stanek, J.L. and Needham, C. (1987):* "Sensititre autoreader for same day breakpoint microdilution susceptibility testing of the family enterobacteriaceae". J. Clin. Microbiol., 25: 1481-1485.
- Duckworth, G.J. (1993):* "Diagnosis and management of methicillin resistant *Staphylococcus aureus* infection". British Med. Journal, 307: 1049-1052.
- Duckworth, G.J.; Lothian, J.L. and Williams, J.D. (1988):* "MRSA: report of an outbreak in a London teaching hospital". J. Hosp. Infect., 11: 1-5.

- Emori, T.G. and Gaynes, R.P. (1993):** "An overview of nosocomial infections including the role of the microbiology laboratory". Clin. Microbiol. Rev., 6: 428-42.
- Emori, T.G.; Edwards, J.R.; Culver, D.H.; Stroud, L.A.; Gaynes, R.N. et al. (1997):** Importance of nosocomial infections at sites other than the four major sites of nosocomial infection in intensive care units. Infect. Cont. Hosp. Epidemiol., 18 (Supl.): P. 31.
- Erlich, H.A. (1989):** "PCR technology" New York, Stock on Press.
- Espy, M. and Smith, T. (1995):** "Comparison of sharp signal system and southern blot hybridization analysis for detection of cytomegalovirus in clinical specimens by P.C.R.". J. Clin. Microbiol., 33: 3028-30.
- Farmer, J.J. (1985):** "Biochemical identification of new species and biogroups of enterobacteriaceae isolated from clinical specimens". J. Clin. Microbiol., 21(1): 46-76.
- Farnham, S.; Moss, N. and Scott, J. (1989):** "The identification of Vibrionaceae using the Vitek gram-negative identification card (GNI) with expanded data base". Abstr. C-263, P. 437. Abstr. 89<sup>th</sup> Annul Meet. Am. Soc. Microbiol." American Society for Microbiology, Washington, D.C.
- Figueiredo, A.M.S.; Ha, E.; Kreiswith, B.N. (1991):** "In vivo: Stability of heterogenous expression classes in clinical isolates of MRSA". Infect. Dis., 164: 883-887.
- Forsythe, W.F.; Brandt, J.A. and Lewis, J.E. (1990):** "Comparison study of Vitek YBC system and API 20C for identification of clinical yeast isolates". Abstr. C-155, P. 369, Abstr. 90<sup>th</sup> Annu. Meet Am. Soc. Microbiol. American Society for Microbiology, Washington, D.C.
- Fred, C.T.; Jasmine, M.M. and Timothy, S.G. (1999):** "Detection and reporting of organisms producing extended spectrum  $\beta$ -Lactamases: Survey of Laboratories in Connecticut". J. Clin. Microbiol., 37(12): 4065-4070.

- Frederick, S.N.; Karen, K.K. and Luisa, A.B. (1988):* "Rapid and overnight microdilution antibiotic susceptibility testing with the Sensititre breakpoint autoreader system". J. Clin. Microbiol. June, 27(6): 1079-1084.
- Free, L. and Sahm, D.F. (1996):* "Detection of enterococcal vancomycin resistance by multiplex PCR". In: PCR Protocols for emerging infectious diseases Ed. Persing, D.H., P. 150-155, Washington, DC: ASM, Press.
- French, G.; Abdulla, Y.; Heathcock, R.; Posten, S. and Cameron, J. (1992):* "Vancomycin resistance in South London". Lancet, 339: 818-819.
- French, G.L.; Cheng, A.F.B. and Ling, J.M.L. (1990):* "Hong Kong strains of methicillin resistant and sensitive *Staphylococcus aureus* have similar virulence". J. Hosp. Infect., 15(2): 117-26.
- Fujita, N.; Komari, T. and Yoshimura, M. (1998):* "Vancomycin resistant enterococci". Rinsho-Byori. Jul., 46(7): 629-36.
- Gargallo-Viola, D. (1989):* "Enzyme polymorphism, prodigiosin production, and plasmid fingerprints in clinical and naturally occurring isolates of *Serratia marcescens*". J. Clin. Microbiol., 27: 860-868.
- Garibaldi, R.A. (1993) :* Hosp acquired UTIs. In : Wenzel RP, ed. Prevention and control of nosocomial infectious. 2<sup>nd</sup> ed., P{. 600 – 13. Baltimore : Williams and Wilkins.
- Garner, J.S. (1996):* Guidelines for handwashing and hospital environmental control. Ann. J. Infect. Cont., 14: 110-126.
- Garner, J.S.; Jarvis, W.R.; Emori, T.G.; Horan, T.C. and Hughes, J.M. (1988):* "CDC definitions for nosocomial infections". Am. J. Infect. Control., 16: 128-140.
- Garner, J.; Hospital Infection Control Practices Advisory Committee (1996):* Guideline for isolation precautions in hospitals. Infect. Cont. Hosp. Epidemiol., 17: 53-80.

- Gavan, T.L.; Jones, R.N. and Barry, A.L. (1980):* "Evaluation of the Sensititre system for quantitative antimicrobial drug susceptibility testing: a collaborative study" *Antimicrob. Agents: Chemother.*, 17: 464.
- Geffers, C.; Gastmeier, P. and Daschner, F. (2001):* "Prevention of postoperative wound infections. Evidence-based recommendations". *Zentrabl. Chir. Feb.*, 126(2): 84-92.
- Geiss, H.K. and Klar, U.E. (2000):* "Evaluation of the BIOMIC Video reader system for routine use in the clinical microbiology laboratory". *Diagn. Microbiol. Infect. Dis.*, 2000 Jul., 37(3): 151-5.
- George, K.H. and Manak, M.M. (1990):* "DNA probe" MacMInan editor Page 11-35.
- Gikas, A.; Roumelaki, M. and Traulakis, G. (1999):* "Repeated multi-centre prevalence of hospital acquired infection in Greek hospitals. CIC Net. Cretan Infection Control Network". *J. Hosp. Infect.* Jan, 41(1): 11-8.
- Glenister, H.M.; Taylor, L.J.; Cooke, E.M. and Bartlett, C.L.R. (1992):* A study of surveillance methods for detecting hospital infection. London, Public Health Laboratory Services.
- Glynn, A.; Ward, V. and Wilson, (1997):* Hospital acquired infection: surveillance, policies and practice. London: Public Health Laboratories Services.
- Godfrey, H. and Evans, A. (2000):* "Catheterization and urinary tract infections", microbiology. *Br. J. Nurs.* Jun., 9(11): 682-4, 686.
- Goldman, D.A.; Weinstein, R.A.; Wenzel, R.P. and Tablan, O.C. (1996):* "Strategies to prevent and control the emergence and spread of antimicrobial resistant microorganism in hospitals: a challenge to hospital leadership". *JAMA*, 275: 234-40.
- Gomez-Herruz, P.; Gonzalez-Palacios, R.; Romanyk, J. and Ena, J. (1995):* "Evaluation of E-test for penicillin susceptibility testing of *Neisseria meningitis*". *Diag. Microb. Infect. Dis.*, 21:115-117.

- Gordts, B. and Van-Landuyt, H. (1998):** "Epidemiology as a tool for hospital infection control". *Acta. Clin. Belg. Apr.*, 53(2): 75-82.
- Gregson, D.; Gopast, D. and Hostetter, P. (1991):** "Evaluation of the Automicropic system's ability to speciate and detect oxacillin resistance in Coagulase negative staphylococci", *Abstr. C-233 P. 381 Abstr. 91<sup>st</sup> Gen. Meet Am. Soc. Microbiol. 1991, American Society for Microbiology, Washington, D.C.*
- Gurtler, V. and Barrie, H.D. (1995):** "Typing of *Staphylococcus aureus* by PCR amplification of variable length 16S-23S rDNA spacer regions: Characterization of spacer sequences". *Microbiology*, 141: 1255-1265.
- Gwyther, J. (1990):** Sharps disposal containers and their use. *J. Hosp. Infect.*, 15: 287-294.
- Haley, R.W.; Garner, J.S. and Hall, C.B. (1985):** "How frequent are outbreaks of nosocomial infection in community hospitals? *Infect. Control*, 6: 233.
- Hastings, J.G.M. and Jolley, A.J. (1995):** "Vancomycin resistant and dependent enterococci in a tertiary referral center 35<sup>th</sup> ICAAC". San Francisco Washington, DC: American Society for Microbiology, Abstract.
- Health and Safety Commission (1992):** The safe disposal of clinical waste. London: HMSO.
- Herwaldt, L.A.; Boyken, L.D. and Pfaller, M.A. (1990):** "Biotyping of Coagulase-negative staphylococci. 108 isolates from nosocomial blood stream infections". *Diagn. Microbiol. Infect. Dis.*, 13: 461-6.
- Holdeman, L.V.; Cato, E.P. and Moore, W.E.C. (1977):** "Anaerobe laboratory manual", 4<sup>th</sup> ed. Virginia, Polytechnic institute and state university, Blackburg, Va.

- Horan, M.E.; Barnard, B. and Chenoweth, C. (1999):** "APIC/CHICA-Canada Infection control and epidemiology: professional and practice standards. Association for professionals in infection control and epidemiology, Inc and the community and hospital infection control association- Canada". *Am. J. Infect. Control*, 1999 Feb. 27(1): 47-51.
- Horan, T.C.; Hall, C.B. and Douglas, R.G. (1986):** "Nosocomial infection surveillance". *MMWR* 35(155): 17.
- Huskins, W.C.; Soule, B.M. and O'Boyle, C. (1998):** "Hospital infection prevention and control: a model for improving the quality of hospital care in low and middle income countries". *Infect. Control Hosp. Epidemiol.* Feb., 19(2): 125-35.
- Iman, E.W. (1998):** "Study of gram negative bacilli causing nosocomial infections in Surgery Departments". Master Degree, Medical Microbiology and Immunology, Faculty of Medicine, Cairo University.
- Isenberg, H.D. (1984):** "Automated methods of bacterial susceptibility testing". *Ann. N.Y. Acad. Scin.*, 428: 436.
- Isenberg, H.D.; Gavan, T.L. and Sonnenwirth, A. (1979):** "Clinical laboratory evaluation of automated detection identification system in analysis of clinical urine specimens." *J. Clin. Microbiol.*, 10: 226.
- Isenberg, H.D.; Sonnenwirth, A. and Taylor, W. (1980):** "Collaborative investigation of the automicrobic system: Enterobacteriaceae biochemical card". *J. Clin. Microbiol.*, 11: 694-702.
- Iwen, P.C.; Kelly, D.M.; Linder, J. and Henrich, S.H. (1996):** "Revised approach for identification and detection of ampicillin and vancomycin a resistance in enterococcus species by using microscan panels". *J. Clin. Microbiol.*, 34: 1779-83.
- Iwen, P.C.; Kelly, D.M.; Reed, E.C. (1995):** "Invasive infection due to candida krusei in immunocompromised patients not treated with fluconazole". *Clin. Infect. Dis.*, 20: 342-7.
- Jepson, O.B. (1986):** "The demise of the "Old" methicillin resistant *Staphylococcus aureus*". *J. Hosp. Infect.*, 7 Suppl. A: 13-7.

- Jett, B.; Free, L. and Sahm, D.F. (1996):** "Factors influencing the Vitek gram positive susceptibility system's detection of van B-Encoded Vancomycin resistance among enterococci". J. Clin. Microbiol., 701-706.
- Jevans, M.D. (1961):** "Celbenin" resistant Staphylococci. BMJ, 1: 124-5.
- Joint Committee on Health Care Laundry (1994):** Guidelines for health care linen service. Hallandale, FL: Textile Rental Services. Association of America.
- Jones, R.N. and Cormican, M.G. (1996):** "Enterococcus". In: Current therapy of infectious disease Ed. Schlossberg Dred. Mosby Year Books, In Press.
- Jones, R.N.; Erwin, M.E. and Andeson, S.C. (1995):** "Emerging multiple resistant enterococci among clinical isolates: validation of the E-test to recognize glycopeptide-resistant strains". Diag. Microbiol. Infect. Dis., 21: 95-100.
- Jones, R.N.; Kehrberg, E.N.; Erwin, M.E. and Anderson, S.C. (1994):** "Prevalence of important pathogens and antimicrobial activity of parenteral drugs at numerous medical centers in the United States. I. Study on the threat of emerging resistance: Real or perceived? Fluoroquinolone Resistance Surveillance Group". Diag. Microbiol. Infect. Dis., 19: 203-15.
- Jorgensen, J.H. (1987):** "Instruments systems that provide rapid (3-6 hours) antibiotic susceptibility results in automation". Clin. Microbiol., 750-755 Boca Raton, CRC Press.
- Josephl, S.; Lana, S.W.; Richard, C.T. and Ronald, J.Z. (1993):** "Collaborative evaluation of the radiometer Sensititre AP80 for identification of gram negative bacilli". J. Clin. Microbiol. May, 31(5): 1179-1184.
- Keane, C.T.; Coleman, D.C. and Cafferkey, M.T. (1991):** "Methicillin-resistant Staphylococcus aureus-a reappraisal". J. Hosp. Infect., 19: 147-52.
- Kerr, S.; Kerr, G.E.; Mackintosh, C.A. and Marples, R.R. (1990):** "A survey of MRSA affecting patients in England and Wales". J. Hosp. Infect., 16: 35-48.

- Kiehlbauch, J.; Kendle, J.M. and Carlson, L.G. (1989):** "Automated antibiotic susceptibility comparative evaluation of four commercial systems and present data". Clin. Lab. Med., 9: 319-340.
- Kim, J.M.; Park, E.S. and Jeong, J.S. (2000):** "Multicentre surveillance study for nosocomial infections in major hospital in Korea. Nosocomial infection surveillance committee of the Korean society for nosocomial infection control". Am. J. Infect. Control Dec., 28(6): 454-8.
- Kitchen, A.D. (1997):** Transfusion microbiology practice. Edited by World Health Organization, P. 23-42.
- Kloos, W.E. and Bannerman, T.L. (1994):** "Update on the clinical significant of Coagulase negative staphylococci". Clin. Microbiol. Rev., 7: 117-40.
- Kloos, W.E. and George, C.G. (1986):** "Identification of staphylococcus species and subspecies with the Microscan Pos ID and Rapid Pos ID panel system". J. Clin. Microbiol., 29: 738-744.
- Kloos, W.E. and Jorgensen, J.H. (1985):** "Staphylococci". In: Manual of Clinical Microbiology, 5<sup>th</sup> ed., Ed. Balows, A., Hausler, W.J., Herrman, K.L., Isenberg, H.D. and Shadov, H.J. P. 143-153, Washington, DC: American Society for Microbiology.
- Knapp, C.C.; Ludwig, M.D. and Washington, J.A. (1994):** "Evaluation of differential inoculum disk diffusion method and Vitek GPS-SA card for detection of oxacillin-resistant Staphylococci". J. Clin. Microbiol., 32: 433-436.
- Kobayashi, H. (1999):** "Hospital infection". Ryoikibetsu-Shokogun-Shirizy 25(3): 394-7.
- Koontz, F.P. (2000):** "Trends in post-operative infections by Gram positive bacteria". Int. J. Antimicrob. Agents. Nov., 16 Suppl. 15: 35-7.

- Koziol, D. and Henderson, D. (1994):** "Nosocomial infections". In: Infectious diseases: A treatise of infectious processes 5<sup>th</sup> edition, Ed. P. Hoeprich, M. Jordan and A. Ronald P. 32-55. U.S.A., J. B. Lippincott Company.
- Kreiswirth, B.; Kornblum, J. and Arbeit, R. (1993):** "Evidence for a clonal origin of methicillin-resistance in *Staphylococcus aureus*". *Science*, 259: 227-30.
- Kuhn, P.J. (1984):** "Comparing the new automated microbiology systems". *Med. Lab. Observer.*, 16: 110.
- Landry, M.L. (1990):** "Nucleic acid hybridization in viral diagnosis". *Clin. Biochem.*, 23: 267-277.
- Lehman, P.F.; Kemker, B.J.; Hsiao, C.B. and Dev, S. (1989):** "Isoenzyme biotypes of *Candida* species". *J. Clin. Microbiol.*, 27: 2514-2521.
- Lessing, M.P.A.; Jordens, J.Z.; Bowler, I.C.J. et al. (1995):** "Molecular epidemiology of a multiple strain outbreak of methicillin-resistant *Staphylococcus aureus* amongst staff and patients". *J. Hosp. Infect.*, 31: 253-260.
- Lin Zhi-Mei; Gao Jian and Xiang Ming-Jie (1994):** "Study on the infection of MRSA in the hospital". In: Proceedings of first Asian-Pacific International Conference on Hospital Infection. Beijing: Society of Nosocomial Infection Control, China Preventive Medicine Association, P. 162-5.
- Ling, L.S.; Dine, I.Y. and Chia, C.H. (2000):** "Evaluation of autoscan W/A and the Vitek GNI + Automicrobic system for identification of non glucose fermenting gram negative bacilli". *J. Clin. Microbiol. Mar.*, 38(3): 1127-1130.
- Lui, K.J. (1987):** "A model-based approach for estimating the mean incubation period of transfusion-associated acquired immunodeficiency syndrome". *Proc. Natl. Acad. Sci.*, 83: 3021.

- Luzzaro, F.; Perilli, M. and Amicosante, G. (2001):** "Properties of multidrug-resistant, ESBL producing proteus mirabilis isolates and possible role of beta-lactam/beta-lactamase inhibitor combinations". *Int. J. antimicrob. Agents.* Feb., 17(2): 131-5.
- Lyznicki, J.; Lester, S. and Springen, D. (1991):** "Comparison of Microscan and Sensititre panels for the rapid identification and susceptibility testing of gram negative rods". *Abst. C208, P. 376. Abstr. 91<sup>st</sup> General Meeting Amer. Soc. Microbiol., Washington, D.C.*
- MacLowry, J.D. and Marsh, H.H. (1968):** "Semi-automatic microtechnique for serial dilution antibiotic sensitivity testing in the clinical laboratory". *J. Lab. Clin. Med.*, 72: 685.
- Maki, D.G. (1993) :** Infections due to infusion therapy. In : Bennet JV, Brachman PS eds. *Hospital infection*, 3<sup>rd</sup> ed., P. 849-890. Boston : Little Brown.
- Maki, D.G.; Alvarado, C.J. and Hussemer, C.A. (1982):** "Relation of the inanimate hospital environment to endemic nosocomial infection". *N. Engl. J. Med.*, 307: 1562-1566.
- Malloy, P.J.; Miceika, B.G. and Ducate, M.J. (1983):** "Automated methods in microbiology: II Identification and susceptibility testing". *Am. J. Med. Tech.*, 49: 313.
- Mangram, A.J.; Horan, T.C. and Pearson, M.L. (1999):** "Guideline for prevention of surgical site infection, 1999 Hospital Infection Control Practices Advisory Committee". *Infect. Control Hosp. Epidemiol.* Apr., 20(4): 250-78. Quiz, 279-80.
- Mansour, J.D.; Robson, J.A. and Arndt, C.W. (1985):** "Detection of Escherichia coli in blood using flowcytometry". *Cytometry* 6 (3): 1986-90.
- Marshall, W.F. (1989):** "Xanthomonas maltophilia: An emerging nosocomial pathogen". *Mayo. Clin. Proc.*, 64: 1097.
- Maslow, J.N. and Mulligan, M.E. (1996):** "Epidemiologic typing systems". *Infect. Cont. Hosp. Epidemiol.*, 17: 595-604.



- Melvin, P.W.; Stanely, M. and Linda, V.P. (1998):** "Clinical importance of identifying coagulase negative Staphylococci isolated from blood cultures: Evaluation of Microscan rapid and Dried overnight gram positive panels versus a conventional reference method". *J. Clin. Microbiol.* July, 36(7): 2089-2092.
- Miele, A.; Bandera, M. and Goldstein, B.P. (1995):** "Use of primers selective for vancomycin resistance genes to determine van genotype in enterococci and to study gene organization in Van A isolates". *Antimicrob. Agents Chemother.*, 39: 1772-1778.
- Miller, J.M. and O'Hara, C.M. (1995):** "Substrate utilization system for identification of bacteria". In: *Manual of Clinical Microbiology* Ed., Murray PR, Baron EJ, Pfaller MA, Tenover FC, Tenover RH, 6<sup>th</sup> ed., P. 103-109. American Society of Microbiology, Washington, D.C.
- Miller, J.M. and Rhoden, D.L. (1991):** "Preliminary evaluation of Biolog, a carbon source utilization method for bacterial identification". *J. Clin. Microbiol.*, 29: 1143-1147.
- Mitchison, D.A. (1972):** "A selective oleic acid albumin agar medium for tubercle bacilli". *J. Med. Microbiol.*, 5: 165-175.
- Moellering, R.C.Jr. (1995):** "Principles of antiinfective therapy". In: *Principles and Practices of infectious diseases*. Ed. Mandell, G.L., Bennett, J.E. and Dolin, R. P. 199-212. New York: Churchill Livingstone.
- Moland, E.S.; Sanders, C.C. and Thomson, K.S. (1998):** "Can results obtained with commercially available Microscan microdilution panels serve as an indicator of beta lactamase production among escherichia coli and Klebsiella isolates with hidden resistance to expanded spectrum cephalosporins and aztreonam?" *J. Clin. Microbiol.* Sep., 36(9): 2575-9.
- Montecalvo, M.A.; Shay, D. and Andryshak, C. (1995):** "Efficacy of enhanced infection control measures to reduce the transmission of VRE (vancomycin resistant enterococci. In: *Program and Abstracts of the 35<sup>th</sup> Interscience Conference on Antimicrobial Therapy and Chemotherapy*". Abstract J. 39 San Francisco.

- Moran, M. and Roberts, G. (1987):** "Radiometric detection, identification and antimicrobial susceptibility testing of mycobacteria". In: Automation in Clinical Microbiology Ed. Jorgensen, J.H P. 31-38. CRC Press, Raton.
- Morgan, M.A.; Horstmeir, C.D. and Roberts, G.D. (1983):** "Comparison of radiometric method (Bactec) and conventional culture media for recovery of mycobacteria smear negative specimens". J. Clin. Microbiol., 18: 384.
- Morosini, M.I.; Canton, R. and Martinez, J. (1995):** "New extended spectrum TEM-type  $\beta$ -lactamase from Salmonella enterica subsp. Enterica isolated in a nosocomial outbreak". Antimicrob. Agents. Chemother., 39: 458-461.
- Morris, J.G.Jr., Shay, D.K. and Hebden, J.N. (1995):** "Enterococci resistant to multiple antimicrobial agents, including vancomycin: establishment of endemicity in a University Medical Center". Ann. Intern. Med., 123: 250-254.
- Mucignat, G.; Tarabini, C.G.L. and Pascoli, L. (1991):** "Preliminary evaluation of Sensititre system for identifying gram negative bacilli". Microbiologica Jul., 14(3): 261-5.
- Mullis, K.B. (1990):** "The unusual origin of the polymerase chain reaction". Sci. Am., 262: 56-65.
- Mullis, K.B. and Faloan, F.A. (1987):** "Specific synthesis of DNA in vitro via a polymerase, catalyze reaction". Methods Enzymol., 155: 335-350.
- Murder, P.R.; Benan, C. and Wagner, M.N. (1991):** "Methicillin-resistant Staphylococcus aureus infection colonization and infection in a long term care facility". Ann. Intern. Med., 114: 107-112.
- Murray, B.E. (1990):** "The life and times of the Enterococcus". Clin. Microbiol. Rev., 3: 46-65.
- Musser, J.M. and Kapur, V. (1992):** "Clonal analysis of MRSA from intercontinental sources: association for the mec gene with divergent phylogenetic lineages implies dissemination by horizontal transfer and recombination". J. Clin. Microbiol., 30: 2058-63.

- Nakasone, I.; Higa, M.; Furugen, F. and Yamane, N. (1999):* "Evaluation of inoculum density prepared by prompt inoculation system and antimicrobial susceptibility test results by the automated Microscan Walkaway system". Rinsho-Nakagami, Okinawa, 902-2015, Japan.
- Narayan, S. (1983):* "Chromatography III ion exchange chromatography". J. Clin. Lab. Automation, 3: 225.
- Nath, S.K.; Thornley, J.H. and Kelly, M. (1994):* "A sustained outbreak of clostridium difficile in a general hospital: persistence of a toxigenic clone in fou units". Infect. Cont. Hosp. Epidemiol., 15: 382-389.
- National Committee for Clinical Laboratory Standards (1984):* Performance standards for antimicrobial disc susceptibility tests. Approved standard M2-A3. National Committee for Clinical Laboratory Standards, Villanova, Pa.
- National Committee for Clinical Laboratory Standards (1990):* Antimicrobial susceptibility testing. Document, M24-P. Villanova, PA: NNCLS.
- National Committee for Clinical Laboratory Standards (1990):* Performance standards for antimicrobial disk susceptibility tests, 4<sup>th</sup> ed. Approved Standard M2-A4 NCCLS, Villanova, PA.
- National Committee for Clinical Laboratory Standards (1993):* Performance Standards for antimicrobial disk susceptibility test: Approved standard, NCCLS Document M2-A5, Villanova, Pennsylvania: NCCLS.
- National Committee for Clinical Laboratory Standards (1997):* Performance standards for antimicrobial disk susceptibility tests 6<sup>th</sup> ed., Vol. 17 no. 1. Approved Standard M2-A6. National Committee for Clinical Laboratory Standards, Wayne, Pa.
- Neuwirth, C.; Siebor, E.; Lopez, J.; Pechinot, A. and Kazimercza, K. (1996):* "Outbreak of TEM-24-producing Enterobacter aerogenes in an Intensive Care Unite and dissemination of the extended spectrum B-lactamase to other members of the family. Enterobacteriaceae". J. Clin. Microbiol., 34: 76-9.

- Nishizawa, T.; Okamoto, H. and Konishi, K. (1997):* "A novel DNA virus (TTV) associated with elevated transaminase levels in post-transfusion hepatitis of unknown etiology". *Biochem. Biophys. Res. Common.*, 241: 92-7.
- Noble, W.C.; Virani, Z. and Cree, R.G.A. (1992):* "Cotransfer of vancomycin and other resistance genes from *Enterococcus faecalis* NCTC 12201 to *Staphylococcus aureus*". *FEMS Microbiol. Lett.*, 93: 195-8.
- Nolte, F.; Williams, R. and Jerris, J. (1993):* "Multicenter clinical evaluation of continuous monitoring blood culture system using fluorescent sensor technology (Bactec, 9240)". *J. Clin. Microbiol.*, 552-557.
- Nolte, F.S.; Karen, K. and Luisa, A.A. (1988):* "Rapid and overnight microdilution antibiotic susceptibility testing with the Sensititre breakpoint autoreader system". *J. Clin. Microbiol.*, 26(6): 1079-1084.
- Noone, M.R.; Pitt, T.L. and Bedder, M. (1983):* "Pseudomonas aeruginosa in an intensive therapy unit: role of cross infections and host factors". *Brit. Med. J.*, 286: 341-4.
- O'Hara, C.M.; Rhoden, D.L. and Smith, P.B. (1990):* "Agreement between visual and automated Uniscept API readings". *J. Clin. Microbiol.*, 28: 452-454.
- Odumeru, J.A.; Steele, M.; Fruhncer, L. and Larkin, C. (1999):* "Evaluation of accuracy and repeatability of identification of food-borne pathogens by automated bacterial identification systems". *J. Clin. Microbiol. Apr.*, 37(4): 944-9.
- Osano, E.; Arakawa, Y. and Wacharotayankun, R. (1994):* "Molecular characterization of an enterobacterial metallo B-found in clinical isolates of *Serratia marcescens* that shows imipenem resistance". *Antimicrob. Agents. Chemother.*, 38: 71-8.
- Oslen, R.J.; Lynch, P.; Coyle, M.B.; Cummings, M.J. et al. (1993):* Examination gloves as barriers to hand contamination and clinical practice. *JAMA*, 270: 350-353.

- Palmer, G.H. and Hamilton, P. (1975):** "Some methods for microbiological assay" The society for applied Bacteriology Technical Series, New York, Academic Press.
- Pangon, B.; Bizet, C.; Burei, A.; Pichon, F.; Philippon, A.; Regnier, B. and Gutmann, L. (1989):** "In vivo selection of a cephamycin-resistant porin-deficient mutant of *Klebsiella pneumoniae* producing a TEM-3- $\beta$ -lactamase". *J. Infect. Dis.*, 159: 1005-1006.
- Park, C.; Naik, S. and Roberts, G. (1984):** "Rapid recovery of mycobacteria from clinical specimens using automated radiometric technic". *Am. J. Clin. Path.*, 81: 341-45.
- Patel, R.; Uhi, J.R.; Kohner, P.; Hopkins, M.K. and Cockerill, F.R. (1997):** "Multiplex PCR detection of Van A, Van B, Van C-1 and Van C-2, C-3 genes in enterococci". *J. Clin. Microbiol.*, 35: 703-707.
- Patterson, J.; Vecchio, J. and Pantelick, E. (1991):** Association of contaminated gloves with transmission of *acinetobacter calcoa ceticus* in an intensive care unit. *Am. J. Med.*, 91: 479-483.
- Patrick, R.M.; Ellen, J.B. and Michael, A.P. (1995):** Manual of clinical microbiology 6<sup>th</sup> ed American Society for microbiology, Washington DC 20005.
- Pegues, D.A.; Pegues, C.F.; Hibbard, P.L.; Ford, D.S. and Hopper, D.L. (1997):** "Emergence and dissemination of a highly vancomycin resistant van A strain of *Enterococcus faecium* at a large teaching school". *J. Clin. Microbiol.*, 35: 1565-70.
- Persing, D.H.; Relman, D.A. and Tenover, T.C. (1996):** "Genotypic detection of antimicrobial resistance". In: PCR protocols for emerging infectious diseases Ed., Persing DH, P. 33-57, Washington DC: American Society for Microbiology.
- Pfaller, M.A. (1995):** Epidemiology of Candidiasis. *J. Hosp. Infect.* 30 (Supl.): 329-38.
- Pfaller, M.A. (1996):** "Nosocomial candidiasis:emerging species, reservoirs and modes of transmission". *Clin. Infect. Dis.*, 22 (Supl. 2): 589-94.

- Pfaller, M.A. and Cormican, M.G. (1996):** "Role of the microbiology laboratory in monitoring and identifying resistance: use of molecular biology". *New Horizon.*, 4: 361-9.
- Pfaller, M.A. and Herwaldt, L.A. (1997):** "The clinical microbiology laboratory and infection control: Emerging pathogens, antimicrobial resistance and new technology". *Clin. Infect. Dis.*, 25: 858-70.
- Pfaller, M.A.; Sahm, D. and Ciaglia, C. (1991):** "Comparison of the autoscan W/A rapid bacterial identification system and Vitek automicrobic system for identification of gram negative bacilli". *J. Clin. Microbiol.*, 29(2): 1422-28.
- Philpson, A. (1983):** "The use of antibiotics in pregnancy". *J. Antimicrob. Chemother.*, 12: 101-104.
- Picco, W.; Pinna, L. and Baruzzo, G. (1992):** "Quality control of laboratory results in real time." *Qual- Assur- Health Care*, 4(1): 61-67.
- Piroth, L.H.; Aube, H. and Doise, J.M. (1998):** "Spread of extended spectrum  $\beta$  Lactamase producing *Klebsiella pneumoniae*: are  $\beta$ -lactamase inhibitors of therapeutic value?" *Clin. Infect. Dis.*, 27: 76-80.
- Pujol, M.; Ardany, C. and Ricart, A. (2000):** "Laboratory capacity to detect antimicrobial resistance", *MMWR-Morb. – Mortal. Wkly- Rep.* Jan 7, 48 (51-52): 1167-71.
- Quinn, J.P. (1994):** "Clinical significance of extended spectrum beta-lactamases". *Eur. J. Clin. Microb. Infect. Dis.*, 13 (Supl.): S34-42.
- Quintalini, R.Jr. and Courvalin, P. (1995):** Mechanisms of resistance to antimicrobial agents. In: *Manual of Clinical Microbiology* Ed., Murray PR, Baron EJ, Pfaller MA, Tenover FC, Tenover RH, 6<sup>th</sup> ed. P. 1308-26. Washington, DC: American Society for Microbiology.
- Raphael, S.S. (1976):** "Automation in clinical chemistry". In: *Med Laboratory technology*, P. 127-144, W.B. Saunders Company.

- Rasha, H.A. (2000):** "Current antimicrobial resistance in clinical bacterial isolates". Master Degree, Medical Microbiology and Immunology, Faculty of Medicine, Cairo University.
- Reagen, D.R.; Pfaller, M.A.; Hollis, R.J. and Wenzel, R.P. (1990):** "Nosocomial candidemia: characterization of the sequence of colonization and nosocomial candidemia using DNA fingerprinting and a DNA probe". J. Clin. Microbiol., 28: 2733-8.
- Reichler, M.R.; Rakovsky, J. and Sakotova, A. (1995):** "Multiple antimicrobial resistance of pneumococci in children with otitis media, bacteremia and meningitis in Slovakia". J. Infect. Dis., 171: 1491-6.
- Resende, C.A. and Figueiredo, A.M.S. (1997):** "Discrimination of methicillin resistant *Staphylococcus aureus* from borderline resistant and susceptible isolates by different methods". J. Med. Microbiol., 46: 145-149.
- Rhame, F.S. (1992):** "The inanimate environment. In: Hospital infections Ed., Bennett J.V., Brachman P.S., 3<sup>rd</sup> ed., P. 299-344. Boston: Little, Brown.
- Rice, L.B.; Willey, S.H. and Papanicolaou, G.A. (1990):** "Outbreak of ceftazidime resistance caused by extended spectrum beta-lactamase at a Massachusetts. Chronic Care Facility", Antimicrob. Agents Chemother., 34: 2143-4.
- Richards, M.J.; Edwards, J.R.; Culver, D.H. and Goynes, R.P. (2000):** "Nosocomial infections in combined medical surgical intensive care units in the united states". Infect. Control Hosp. Epidemiol. Aug., 21(8): 510-515.
- Riley, L.W.; Ceballos, B.S.O.; Trabulsi, L.R. and Blake, P.A. (1984):** "The significance of hospitals as reservoirs for endemic multiresistant *Salmonella typhimurium* causing infection in urban Brazilian children". J. Infect. Dis., 150: 236-41.
- Rosenblatt, J.E. (1987):** "Laboratory tests used to guide antimicrobial therapy". Mayo Clin. Pro., 62: 799-805.

- Roy, M. (1997):** "The operating theatre: A special environmental area". In: Prevention and control of nosocomial infections Ed., Wenzel RP, 3<sup>rd</sup> ed., P. 515-538, Baltimore: Williams and Wilkins.
- Rubin, F.A.; Finch, M.J. and Carillo, C. (1990):** "Combination of Vi and Hd probes to detect salmonella typhi in stool to identify chronic carriers". Program Abst. Intersci. Conf. on antimicrob agents and chemother., 29<sup>th</sup> Abstr. No. 861.
- Rutala, W.A. (1993):** Disinfection, sterilization and waste disposal. In: Wenzel RP, ed. Prevention and control of nosocomial infections, 2<sup>nd</sup> ed., P. 460-495. Baltimore: Williams and Wilkins.
- Rutala, W.A. and Weber, D.J. (1991):** Infectious waste: mismatch between science and policy. N. Engl. J. Med., 325: 587-582.
- Rydberg, J.; Larsson, C. and Miorner, H. (1994):** "Resistance to Fluoroquinolones in Pseudomonas aeruginosa and Klebsiella pneumoniae". Scand. J. Infect. Dis., 26: 317-20.
- Sader, H.S.; Hollis, R.J. and Pfaller, M.A. (1995):** "The use of molecular techniques in the epidemiology and control of infectious diseases". Clin. Lab. Med., 15: 407-31.
- Sader, H.S.; Jones, R.N. and Gales, A.C. (1998):** "Antimicrobial susceptibility patterns for pathogens isolated from patients in Latin American medical centers with a diagnosis of pneumonia: analysis of results from the SENTRY Antimicrobial Surveillance Program (1997). SENTRY Latin America Study Group". Diag. Microbiol. Infect. Dis. Dec., 32(4): 289-301.
- Sahm, D.F. and Olsen, L. (1990):** "In vitro detection of enterococcal vancomycin resistance". Antimicrob. Agents. Chemother., 34: 1846-8.
- Saiki, R.K.; Gelfand, D.H. and Stoffel, S. (1988):** "Primer directed enzymatic amplification of DNA with a thermostable DNA polymerase". Science, 239: 487-494.

- Sandra, R.; Leslie, M. and Carol, A.I. (1995):* "Comparison of Microscan Walkaway system and Vitek system for identification of gram negative bacteria". J. Clin. Microbiol. Nov., 33(11): 3044-3046.
- Schaberg, D.R.; Gulver, D.H. and Gaynes, R.P. (1991):* "Major trends in the microbial etiology of nosocomial infection". Am. J. Med., 91: 72S-75S.
- Scheckler, W.E.; Brimhall, D. and Buck, A.S. (1998):* "Requirements for infrastructure and essential activities of infection control and epidemiology in hospitals: A consensus panel report. Society for health care epidemiology of America". Am. J. Infect. Control, Feb., 26(1): 47-60.
- Schonian, G.; Graser, Y. and Starke, R. (1990):* "Trends in medical microbiology: gene probes in medical microbiology". Z. Gesmte-Hyg., 36(9): 466-70.
- Schulz, J.E. and Sahm, D.F. (1993):* "Reliability of the E-test for detection of ampicillin, vancomycin, and high level aminoglycoside resistance in Enterococcus". J. Clin. Microbiol., 31: 3336-3339.
- Schulz, K.; Bernhardt, H. and Schroder, G. (1997):* "Candida identification: experiences with the Vitek automated system". Mycoges, 40: 86-90.
- Segura, M.; Alvarezlerma, F. and Fellado, J.M. (1995):* "Clinical trial of the effect of a new catheterhub on the prevention of CVC related sepsis. Interscience Conference on Antimicrobial agents and chemotherapy, San Fransciso, 258, Abstract.
- Seto, W.H. (1995):* Staff compliance with infection control practices: application of behavioral sciences. J. Hosp. Infect., 30S: 107-115.
- Shanson, D.C. (1999):* "Hospital infection". In: Microbiology in Clinical Practice. Butterworth-Heinemann. Oxford, Aukland-Boston, New Delhi.
- Shapiro, H. (1996):* "Flow cytometry in laboratory Microbiology: New Direction". ASM News 56(11): 554.

- Shen, H.D.; Chook, K.B.; Tsai, W.C.; Ten, T.M.; Yeh, J.Y. and Han, S.H. (1988):* "Differential identification of *Candida* species and other yeasts by analysis of 35S methionine-labeled polypeptide profiles". *Anal. Biochem.*, 175: 548-551.
- Sherris, J.C. and Ryan, K.J. (1982):* "Evaluation of automated and rapid methods". In: *Rapid methods and automation in microbiology* Ed., R.C. Tilton, P. 1-5. American Society for Microbiology, Washington, D.C.
- Sherris, J.C. and Ryan, K.J. (1985):* "Rapid Methods and Automation in Microbiology-1981" New York: Springer- Verlag.
- Shigei, J.; Shimabukuro, M. and Pezzlo, L. (1995):* "Value of terminal subculture for blood cultures monitored by Bactec 9240". *J. Clin. Microbiol.*, 33: 1385-88.
- Shoshana, B.; Sharon, L.A.; Jamie, D.B. and David, A.B. (1997):* "Multicentre evaluation of the Microscan rapid gram negative identification type 3 panel". *J. Clin. Microbiol.* Oct., 35(10): 2531-36.
- Shulman, M.A.; Navarro, M.C. and Bahrenburg, J.A. (1987):* "Comparison of the ALADIN video image processing to manual interpretation of Uniscept 20E". Abstr, C-58, P. 333 Abstr. 87<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. 1987, American Society for Microbiology, Washington, D.C.
- Simmonds, J.E.; Motyl, M.R. and McKittrick, J.C. (1990):* "Evaluation of Vitek Yeast Biochemical Card (YBC) with expanded data base and two rapid enzymatic panels: Microscan Yeast Identification Panel (YIP) and APT Yeast-Ident (Y-I) systems for identification of medically important yeasts". Abstr., 1068, P. 264. Program Abstr 30<sup>th</sup> Intersci. Conf. Antimicrob. Agents Chemother. American Society for Microbiology, Washington, D.C.
- Smith, P.B.; Gavan, T.L. and Isenberg, H.D. (1978):* "Multilaboratory evaluation of an automated microbial detection/identification system". *J. Clin. Microbiol.*, 8: 657-666.

- Smith, T.F. (1987):** "Structure, classification and replication of virus". In: Transfusion-transmitted viruses: Epidemiology and pathology Ed. Insalaco, ST and Menitove, JE (eds), PP. 1-16. American association of blood Banks, Arlington, VA.
- Smoczyński, C.; Castella, M.M. and Bahrani, N.K. (1993):** "Increased detection of anaerobic bacteria with use of fibroptic light". CL. Inf. Dis., 16 (Suppl. 4): S322-324.
- Smyth, E.T.; McIlvenny, G. and Barr, J.G. (1997):** "Automated entry of hospital infection surveillance data". Infect. Control. Hosp. Epidemiol., 18(7): 486-91.
- Snell, J.J.S. (1994):** "Problems in susceptibility testing findings of UK NEQAS for microbiology". J. Antimicrob. Chemother., 33: 1-4.
- Soheir, A.A. (1991):** "Hospital acquired infection caused by aerobic gram negative bacilli". M.D. Degree, Clinical Pathology Department, Benha Faculty of Medicine, Zagazig University.
- Sonnenwirth, A.C. (1980):** "Gram negative bacilli, Vibrios and Spirilla". In: Gradwohl's clinical laboratory methods and diagnosis Ed. Sonnenwirth, A.C. and Jarett, L. P. 1731-1853. C.V. Mosby Company, Toronto, London.
- Speller, D. and Humphreys, H. (1998):** "Hospital acquired infections. In: Topley and Wilson's Microbiology and Microbial infections. Ed. W. Hausler and M. Sussman 9<sup>th</sup> edition, P. 188-229. Great Britain: Arnold.
- Spencer, R.C. (1995):** "The emergence of epidemic multiple antibiotic-resistant *Stenotrophomonas* (*Xanthomonas*) maltophilia and *Burkholderia* (*Pseudomonas*) cepacia". J. Hosp. Infect., 30 (Suppl.): 453-64.
- Stager, C.E. and Davis, J.R. (1992):** "Automated systems for identification of microorganisms". Clin. Microbiol. Rev., 5: 302-27.

- Staneck, J.L.; Allen, S.D. and Harris, E.E. (1985):* "Automated reading of MIC microdilution trays containing fluorogenic enzymes substrates with the sensititre autoreader". J. Clin. Microbiol., 22: 187-191.
- Staneck, J.L.; Allen, S.D. and Harris, E.E. (1988):* "Rapid MIC determinations using the sensitive autoreader". J. Clin. Microbiol., 26: 1-7.
- Staneck, J.L.; Lans, W. and Richard, C. (1993):* "Collaborative evaluation of the radiometer sensititre AP80 for identification of gram-negative bacilli". J. Clin. Microbiol., 21(5): 1179-1184.
- Staneck, J.L.; Vincelette, J.; Lamothe, F. and Polk, E.A. (1983):* "Evaluation of the Sensititre system for identification of Enterobacteriaceae". J. Clin. Microbiol. Apr., 17(4): 647-54.
- Staszkw, E.; Wojkowsha, Mach, J. and Kuthan, R. (2000):* "Dominant etiological factors of urinary tract infections in various hospital departments and their resistance to chemotherapeutic agents". Przegl. Epidemiol., 54(3-4): 271-9.
- Stephen, C.E.; Harddo, C.J.; Kontrick, C. and Campbell, S. (1994):* "Rapid detection of vancomycin-resistant enterococci". J. Clin. Microbiol., 32: 2182-4.
- Stephenson, J. (1998):* "Emerging infections on center stage at first major international meeting". JAMA, 279(14): 1055-1056.
- St-Germain, G. and Beauchesne, D. (1991):* "Evaluation of the Microscan rapid yeast identification panel". J. Clin. Microbiol., 29: 2296-2299.
- Stoakes, L.; Kelly, T. and Manarin, K. (1990):* "Accuracy and reproducibility of the Microscan Rapid anaerobe identification system with an automated reader". J. Clin. Microbiol., 28: 1135-1138.
- Stoakes, L.; Schieven, B.C. and Ewan, P. (1992):* "Evaluation of Microscan rapid Pos Combo Panels for identification of Staphylococci". J. Clin. Microbiol., 30: 93-95.

**Swartz, M.N. (1994):** "Hospital acquired infections: diseases with increasingly limited therapies". Proc. Natl. Acad. Sci. USA 91(7): 2420-7.

**Swenson, J.M.; Clark, N.C.; Ferraro, M.J.; Sahm, D.F.; Doern, G.; Pfaller, M.A.; Reller, L.B. and Tenover, F.C. (1994):** "Development of standardized screening method for detection of vancomycin resistant enterococci". J. Clin. Microbiol., 32: 1700-1704.

***Tegtmeier, G.E. (1987):*** "The role of blood transfusion in the transmission of herpes viruses". In: Transfusion-Transmitted viruses: Epidemiology and Pathology Ed. Insalaco, SJ and Mentiove, JE., PP. 41-68. American Association of Blood Banks Arlington, VA.

**Tenover, F.C. (1991):** "Novel and emerging mechanisms of antimicrobial resistance in nosocomial pathogens". Am. J. Med., 91 (Supl. 3B): 76S-81S.

**Tenover, F.C.; Arbeit, R. and Archer, G. (1994):** "Comparison of traditional and molecular method of typing isolates of *Staphylococcus aureus*". J. Clin. Microbiol., 32: 407-15.

**Tenover, F.C.; Mizuki, T.S. and Carlson, L.G. (1990):** "Evaluation of autoscan-W/A automated system for the identification of non glucose fermenting gram negative bacilli". J. Clin. Microbiol., 28: 1628-1634.

**Tenover, F.C.; Popovic, T. and Olsvik, O. (1997):** “Genetic methods for detecting antibacterial resistance genes”. In: Manual of Clinical Microbiology Ed., Murray PR, Baron EJ, Pfaller MA, Tenover FC, Tenover RH, 6<sup>th</sup> ed., P. 1368-1378. Washington, DC: American Society for Microbiology.

**Tenover, F.C.; Swenson, J.M.; O'Hara, C.U. and Stocker, S.A. (1995):**  
"Ability of commercial and reference antimicrobial susceptibility testing methods to detect vancomycin resistant enterococci". J. Clin. Microbiol., 33: 1524-7.

- Tenover, F.C.; Tokars, J.; Swenson, J.; Paul, S.; Spitalmy, K. and Jarvis, W. (1993):** "Ability of clinical laboratories to detect antimicrobial agent-resistant enterococci". *J. Clin. Microbiol.*, 31: 1693-1699.
- Thornsberry, C. (1985):** "Automated procedures for antimicrobial susceptibility tests. In: *Manual of Clinical Microbiology* Ed., E.H. Lennette, A Balows, W.J. Hausler, Jr., and H.J. Shadomy. 4<sup>th</sup> ed. P 1015-1018. American Society for Microbiology, Washington, D.C.
- Tice, L.S. and Roberts, G.D. (1986):** "Optimal recovery of mycobacteria from clinical specimens using a radiometric (BACTEC) method". Abstr. U 38, A.S.M Annual Meeting, Washington, DC.
- Tisdall, P.A.; DeYoung, D. and Roberts, G.D. (1982):** "Identification of clinical isolates of mycobacteria with gas liquid chromatography: a ten method follow up study". *J. Clin. Microbiol.*, 16: 400.
- Tomasz, A.; Drugeon, H.B.; DeLencastre, H.M.; Jabes, D.; McDougall, L. and Bille, J. (1989):** "New mechanisms for methicillin resistance in *Staphylococcus aureus*: Clinical isolates that lack the PBP 2 a gene and contain normal PBP with modified penicillin-binding capacity". *Antimicrob. Agents Chemother.*, 33: 1869-1874.
- Tomer, A.; Harker, L.A. and Burstein, S.A. (1988):** "Flowcytometric analysis of normal human megakaryocytes". *Blood*, 71(5): 1244-52.
- Torneporth, N.G.; Roberts, R.B.; John, J.; Hafner, A. and Riley, L.W. (1996):** "Risk factors associated with vancomycin resistant *Enterococcus faecium*. Infection or colonization in 145 matched case patient and control patients". *Clin. Infect. Dis.*, 23: 767-72.
- Tritz, D.M.; Peter, C. and Woods, G.L. (1990):** "Evaluation of Microscan for identification of enterococcus species". *J. Clin. Microbiol.*, 28(6): 1477-1478.

- Ulrich, P.G. and Wannlund, J.C. (1984):** "Bioluminescence in the microbiology laboratory". *Am. Clin. Prod. Rev.* November, P. 50.
- Van Horn, K.; Gedris, C.A. and Rodney, K.M. (1996):** "Selective isolation of vancomycin resistant enterococci". *J. Clin. Microbiol.*, 34: 924-927.
- Van-Dilla, M.A.; Langlois, R.G. and Yajko, D. (1983):** "Bacterial characterization by flow cytometry". *Science*, 220(4597): 620-622.
- Vercauteren, E.; Descheemaeker, P. and Ieven, M. (1997):** "Comparison of screening methods for detection of extended spectrum  $\beta$ -Lactamases and their prevalence among blood isolates of *Escherichia coli* and *Klebsiella* Spp in a Belgian teaching hospital". *J. Clin. Microbiol.*, 35: 2191-2197.
- Vivas, J.; Perez, M.J.; Saa, A.I. and Barbeyto, L. (2002):** "Identification of motile *Aeromonas* Spp with the Microscan System". WWW. *Aeromonas*. Com.
- Vrielink, H.; Zaaijer, H.L. and Reesink, H.W. (1997):** "The clinical relevance of HTLV type I and II in transfusion medicine". *Transfus. Med. Rev.*, 11: 173.
- Wagenlehner, F.M. and Naber, K.G. (2000):** "Hospital acquired urinary tract infection". *J. Hosp. Infect.* Nov., 46(3): 171-81.
- Waites, K.B.; Brookings, E.S.; Moser, S.A. and Zimmer, B.L. (1998):** "Direct bacterial identification from positive BacT/Alert blood cultures using Microscan overnight and rapid panels". *Diagn. Microbiol. Infect. Dis. Sep.*, 32(1): 21-26.
- Wallace, R.J.Jr. (1994):** "Recent changes in taxonomy and disease manifestations of the rapidly growing mycobact". *Eur. J. Clin. Microb. Infect. Dis.*, 13: 953-60.
- Wang, J.T.; Chen, Y.C. and Yang, T.L. (2002):** "Molecular epidemiology and antimicrobial susceptibility of methicillin resistant *Staphylococcus aureus* in Taiwan". *Diagnostic Microbiology and Infectious Disease*, 42: 199-203.

- Weber, D.J. and Rutala, W.A. (1997):* "Environmental issues and nosocomial infections. In: Prevention and control of nosocomial infections Ed., Wenzel, R.R 3<sup>rd</sup> ed., P. 491-514. Baltimore: Williams and Wilkins.
- Weber, S.; Pfaller, M.A. and Herwaldt, L.A. (1997):* "Role of molecular epidemiology of infection control". Infect. Dis. Clin. North Am., 11: 257-78.
- Wegdan, A.A. and El-Akad, M. (1996):* "Incidence of multiresistant gram negative isolates". Egypt. J. Med. Microb., 5(1): 13-16.
- Weinstein, F.C.; Kelley, R. and Nothhaft, D. (1991):* "Controlled evaluation of Bactec plus 26 and Rochsepti-Check aerobic blood culture bottles". Diagn. Microbiol. Infect. Dis., 29: 879.
- Wharton, M.; Cochi, S.L. and Hutcheson, R.H. (1990):* "Mumps transmission in hospitals". Arch. Intern. Med., 150: 47-49.
- Whitehouse, J.D.; Sexton, D.J. and Kirkland, K.B. (1998):* "Infection control: Past, present and future issues". Compr. Ther. Feb., 24(2): 71-7.
- Willey, B.M.; Kreiswirth, B.N.; Simer, A.E.; William, S.G.; Sriver, S.R. and Phillips, S.A. (1992):* "Detection of vancomycin resistance in enterococcus species". J. Clin. Microbiol., 30: 1621-4.
- Woeltje, K.F. and Fraser, V.J. (1998):* "Preventing nosocomial infections in the intensive care unit-lessons learned from outcomes research". New Horiz. Feb., 6(1): 84-90.
- Wong, E.S.; Stokka, J.L.; Chinchilli, V.M. and William, D.S. (1991):* Are universal precautions effective in reducing the number of occupational exposures among health care worker? JAMA, 265: 1123-1128.
- Woodford, N.; Johnson, A.P. and George, R.C. (1991):* "Detection of glycopeptide resistance in clinical isolates of gram positive bacteria". J. Antimicrob. Chemother., 28: 483-486.

- Woodford, N.; Johnson, A.P. and Morrison, D. (1995a):** "Current prospectives on glycopeptide resistance". Clin. Microbiol. Rev., 8: 585-615.
- Woodford, N.; Morrison, D.; Johnson, A.P. et al. (1995b):** "Plasmid Mediated van B Glycopeptide Resistance in Enterococci". 1: 235-240.
- Woodford, N.; Morrison, D.; Johnson, A.P.; Briant, N. and George, R.C. (1993):** "Application of DNA probes for rRNA and Van A genes to investigation of a nosocomial cluster of vancomycin resistant enterococci". J. Clin. Microbiol., 31: 653-658.
- Woods, G.L. (1992):** "Automation in clinical microbiology". Am. J. Clin. Pathol., 98(4): 522-30.
- Woolfrey, B.F.; Lally, R.T. and Ederer, M.N. (1984):** "Evaluation of the Automicrobic system for identification and susceptibility testing of gram negative bacilli". J. Clin. Microbiol., 20: 1053-1059.
- Zabransky, R.J.; Dinuzzo, A.R. and Wood, G.L. (1994):** "Detection of vancomycin resistance in enterococci by the alamar MIC system". J. Clin. Microbiol., 33: 791-793.

## DATA OF PATIENTS

**Data of patients yielding gram negative isolates**

| No. | *Age | Sex | Specimen | Department | Clinical diagnosis | Duration of stay | Conventional methods |              | Automated methods |              |
|-----|------|-----|----------|------------|--------------------|------------------|----------------------|--------------|-------------------|--------------|
|     |      |     |          |            |                    |                  | Routine B.R.         | BBL          | Microscan         | Sensititre   |
| 1   | 9    | M   | Urine    | Urology    | Renal trauma       | 10 day           | E. coli              | E. coli      | E. coli           | E. coli      |
| 2   | 6    | F   | Urine    | Urology    | Renal stone        | 12 day           | P. mirabilis         | p. mirabilis | P. mirabilis      | p. mirabilis |
| 3   | 36   | M   | Urine    | Urology    | Varicocele         | 10 day           | P. vulgaris          | P. vulgaris  | P. vulgaris       | P. vulgaris  |
| 4   | 16   | M   | Urine    | Urology    | Hydrocele          | 15 day           | K. pneumoniae        | K.pneumoniae | K. pneumoniae     | K. terrigena |
| 5   | 45   | F   | Urine    | Urology    | Ureteric stricture | 45 day           | E. coli              | E. coli      | E. coli           | E. coli      |
| 6   | 56   | M   | Urine    | Urology    | Prostatectomy      | 38 day           | P. mirabilis         | P. mirabilis | P. mirabilis      | P. penneri   |
| 7   | 44   | M   | Urine    | Urology    | Hydrocele          | 50 day           | E. coli              | E. coli      | E. coli           | E. coli      |
| 8   | 23   | M   | Urine    | Urology    | Ureteric stricture | 12 day           | P. mirabilis         | P. mirabilis | P. mirabilis      | P. mirabilis |
| 9   | 12   | M   | Urine    | Urology    | Stone ureter       | 9 day            | P. mirabilis         | P. mirabilis | P. mirabilis      | P. mirabilis |
| 10  | 48   | M   | Urine    | Int. Med   | C.V strock         | 30 day           | E. coli              | E. coli      | E. coli           | E. coli      |
| 11  | 35   | F   | Urine    | Gyna.      | Hysterectomy       | 10 day           | E. coli              | E. coli      | E. coli           | E. coli      |
| 12  | 18   | M   | Urine    | Urology    | Stone utreter      | 10 day           | P. mirabilis         | P. mirabilis | P. mirabilis      | P. mirabilis |
| 13  | 53   | M   | Urine    | Urology    | Cancer bladder     | 45 day           | E. cloacae           | E. cloacae   | K. oxytoca        | E. cloacae   |
| 14  | 58   | M   | Urine    | Surgery    | Postoperative      | 30 day           | E. coli              | E. coli      | E. coli           | E. coli      |
| 15  | 30   | M   | Urine    | Surgery    | Postoperative      | 8 day            | E. coli              | E. coli      | E. coli           | E. coli      |
| 16  | 42   | F   | Urine    | Orthopedic | Joint-pro thesis   | 20 day           | P. mirabilis         | P. mirabilis | P. mirabilis      | P. mirabilis |
| 17  | 42   | F   | Urine    | Urology    | Stone ureter       | 18 day           | E. aerogenes         | E. aerogenes | E. aerogenes      | E. aerogenes |
| 18  | 54   | M   | Urine    | Int. Med   | Hepatic coma       | 32 day           | E. coli              | E. coli      | E. coli           | E. coli      |
| 19  | 39   | F   | Urine    | Int. Med   | C.V strock         | 15 day           | P. vulgaris          | P. vulgaris  | P. vulgaris       | P. vulgaris  |
| 20  | 18   | M   | Urine    | Urology    | Accident           | 12 day           | E. coli              | E. coli      | E. coli           | E. coli      |

\* Age = years except those from nursery (days).

B.R. = Biochemical reaction.

| No. | Age    | Sex | Specimen | Department | Clinical diagnosis | Duration of stay | Conventional methods |                      | Automated methods |                      |
|-----|--------|-----|----------|------------|--------------------|------------------|----------------------|----------------------|-------------------|----------------------|
|     |        |     |          |            |                    |                  | Routine B.R.         | BBL                  | Microscan         | Sensititre           |
|     |        |     |          |            |                    |                  |                      |                      |                   |                      |
| 21  | 21     | M   | Urine    | Orthopedic | Accident           | 28 day           | E. coli              | E. coli              | E. coli           | E. coli              |
| 22  | 11     | F   | Urine    | Urology    | Stone ureter       | 15 day           | E. coli              | E. coli              | E. coli           | E. coli              |
| 23  | 32     | F   | Urine    | Urology    | Renal stone        | 14 day           | P. mirabilis         | P. mirabilis         | P. mirabilis      | P. mirabilis         |
| 24  | 34     | M   | Urine    | Urology    | Varicocele         | 24 day           | P. vulgaris          | P. vulgaris          | P. penneri        | P. vulgaris          |
| 25  | 42     | F   | Urine    | Gyna.      | Postoperative      | 12 day           | E. aerogenes         | E. aerogenes         | E. aerogenes      | *Pantoea-agglomerans |
| 26  | 62     | M   | Urine    | Urology    | Cancer bladder     | 20 day           | P. vulgaris          | P. vulgaris          | P. vulgaris       | P. vulgaris          |
| 27  | 48     | F   | Urine    | Urology    | Renal stone        | 18 day           | C. freundii          | C. freundii          | C. freundii       | C. freundii          |
| 28  | 55     | F   | Urine    | Urology    | Renal stone        | 35 day           | P. mirabilis         | P. mirabilis         | P. mirabilis      | P. mirabilis         |
| 29  | 24     | F   | Urine    | Gyna.      | Hysterectomy       | 12 day           | P. mirabilis         | P. mirabilis         | P. mirabilis      | P. mirabilis         |
| 30  | 62     | M   | Urine    | Urology    | Nephrostomy        | 14 day           | E. coli              | E. coli              | E. coli           | E. coli              |
| 31  | 13     | M   | Urine    | Urology    | Hydrocele          | 12 day           | E. cloacae           | E. cloacae           | E. cloacae        | C. freundii          |
| 32  | 49     | M   | Urine    | Urology    | Cancer bladder     | 35 day           | E. coli              | E. coli              | E. coli           | E. coli              |
| 33  | 58     | F   | Urine    | Gyna.      | Cancer cervix      | 5 day            | E. coli              | E. coli              | E. coli           | E. coli              |
| 34  | 52     | F   | Urine    | Urology    | Renal stone        | 25 day           | P. vulgaris          | P. vulgaris          | P. vulgaris       | P. vulgaris          |
| 35  | 46     | M   | Urine    | Tropical   | Hepatic coma       | 15 day           | E. aerogenes         | E. aerogenes         | E. aerogenes      | E. aerogenes         |
| 36  | 27     | M   | Urine    | Urology    | Hydrocele          | 18 day           | E. coli              | E. coli              | E. coli           | E. coli              |
| 37  | 41     | M   | Urine    | I.C.U      | C.V strock         | 7 day            | E. cloacae           | E. cloacae           | E. cloacae        | E. tylorae           |
| 38  | 18days | F   | Urine    | Nursery    | Neonatal jaundice  | 18 day           | E. agglomerans       | *Pantoea agglomerans | E. agglomerans    | *Pantoea agglomerans |
| 39  | 21     | F   | Urine    | Gyna.      | Tubo. Ovarian cyst | 4 day            | P. vulgaris          | P. vulgaris          | P. vulgaris       | P. vulgaris          |
| 40  | 28days | M   | Urine    | Nursery    | Premature          | 28 day           | E. coli              | E. coli              | E. coli           | E. coli              |

\* Pantoea agglomerans = Enterobacter agglomerans

| No. | Age | Sex | Specimen            | Department | Clinical diagnosis | Duration of stay | Conventional methods |                | Automated methods |                |
|-----|-----|-----|---------------------|------------|--------------------|------------------|----------------------|----------------|-------------------|----------------|
|     |     |     |                     |            |                    |                  | Routine B.R.         | BBL            | Microscan         | Sensititre     |
| 41  | 42  | F   | Pus                 | Gyna.      | Post laparoscopy   | 7 day            | E. cloacae           | E. cloacae     | E. cloacae        | E. cloacae     |
| 42  | 55  | F   | Pus                 | Orthopedic | Joint prothesis    | 15 day           | K. pneumoniae        | K. pneumoniae  | K. pneumoniae     | K. pneumoniae  |
| 43  | 24  | F   | Pus                 | Surgery    | Appendicectomy     | 8 day            | E. aerogenes         | E. aerogenes   | E. aerogenes      | S. fonticola   |
| 44  | 58  | M   | Pus                 | Urology    | Hydronephrosis     | 18 day           | P. vulgaris          | P. vulgaris    | P. vulgaris       | P. vulgaris    |
| 45  | 45  | M   | Pus                 | Orthopedic | Accident           | 10 day           | E. cloacae           | E. cloacae     | E. cloacae        | E. cloacae     |
| 46  | 39  | F   | Pus                 | Orthopedic | Joint prothesis    | 18 day           | M. morganii          | M. morganii    | M. morganii       | M. morganii    |
| 47  | 34  | M   | Pus                 | Orthopedic | Accident           | 12 day           | Prov. Rettgeri       | Prov. Rettgeri | Prov. Rettgeri    | Prov. Rettgeri |
| 48  | 49  | M   | Pus                 | Urology    | Nephrostomy        | 12 day           | E. aerogenes         | E. aerogenes   | E. aerogenes      | E. aerogenes   |
| 49  | 22  | F   | Pus                 | Surgery    | Appendicectomy     | 7 day            | E. coli              | E. coli        | E. coli           | E. coli        |
| 50  | 30  | F   | Pus                 | Gyna.      | Ovarian cyst       | 7 day            | E. cloacae           | E. cloacae     | E. cloacae        | E. cloacae     |
| 51  | 58  | M   | Swab from bed sores | I.C.U      | C.V. strock        | 10 day           | E. aerogenes         | E. aerogenes   | E. aerogenes      | E. aerogenes   |
| 52  | 58  | F   | Swab from bed sores | I.C.U      | Coma               | 15 day           | P. vulgaris          | P. vulgaris    | P. vulgaris       | P. vulgaris    |
| 53  | 50  | F   | Conj. swab          | Ophthalmic | Postoperative      | 9 day            | S. marcescens        | S. marcescens  | S. marcescens     | s. marcescens  |
| 54  | 65  | M   | Sputum              | Int. med.  | Coma               | 20 day           | S. marcescens        | S. marcescens  | S. marcescens     | S. marcescens  |
| 55  | 58  | M   | Sputum              | Chest      | Pleural effusion   | 14 day           | M. morganii          | M. morganii    | M. morganii       | M. morganii    |
| 56  | 62  | M   | Sputum              | Chest      | Cor-pulmonale      | 18 day           | K. pneumoniae        | K. pneumoniae  | K. pneumoniae     | K. pneumoniae  |
| 57  | 9   | M   | Sputum              | Pediatric  | Nephritic syndrome | 10 day           | E. cloacae           | E. cloacae     | E. cloacae        | E. cloacae     |
| 58  | 52  | F   | Sputum              | I.C.U.     | A.F                | 8 day            | K. pneumoniae        | K. pneumoniae  | K. pneumoniae     | K. pneumoniae  |
| 59  | 68  | M   | Sputum              | I.C.U.     | Coma               | 10 day           | K. spp               | K. oxytoca     | K.ornithinolytica | K. oxytoca     |
| 60  | 48  | M   | Sputum              | Cardiology | Massive infarction | 7 day            | K. pneumoniae        | K. pneumoniae  | K. ozenae         | K. pneumoniae  |

| No. | Age    | Sex | Specimen | Department | Clinical diagnosis           | Duration of stay | Conventional methods |               | Automated methods                        |               |
|-----|--------|-----|----------|------------|------------------------------|------------------|----------------------|---------------|------------------------------------------|---------------|
|     |        |     |          |            |                              |                  | Routine B.R.         | BBL           | Microscan                                | Sensititre    |
| 61  | 52     | M   | Sputum   | I.C.U      | C.S. strock                  | 15 day           | K. pneumoniae        | K. pneumoniae | K. pneumoniae                            | K. pneumoniae |
| 62  | 58     | F   | Sputum   | I.C.U      | C.S. strock                  | 10 day           | K. pneumoniae        | K. pneumoniae | K. pneumoniae                            | K. pneumoniae |
| 63  | 62     | M   | Sputum   | Int. Med.  | Hepatic coma                 | 12 day           | K. pneumoniae        | K. pneumoniae | K. pneumoniae                            | K. pneumoniae |
| 64  | 65     | F   | Sputum   | I.C.V.     | Coma                         | 11 day           | S. marcescens        | S. marcescens | S. marcescens                            | S. marcescens |
| 65  | 10 day | F   | Blood    | Nursery    | N. Jaundice                  | 10 day           | K. pneumoniae        | K. pneumoniae | K. pneumoniae                            | K. pneumoniae |
| 66  | 25day  | M   | Blood    | Nursery    | Premature                    | 25 day           | E. coli              | E. coli       | E. coli                                  | E. coli       |
| 67  | 18 day | F   | Blood    | Nursery    | Premature                    | 18 day           | E. coli              | E. coli       | E. coli                                  | E. coli       |
| 68  | 20 day | M   | Blood    | Nursery    | N. jaundice                  | 20 day           | P. mirabilis         | P. mirabilis  | P. mirabilis                             | P. mirabilis  |
| 69  | 37 day | F   | Blood    | Nursery    | Premature                    | 37 day           | E. coli              | E. coli       | E. coli                                  | E. coli       |
| 70  | 15 day | M   | Blood    | Nursery    | Cyanosis                     | 15 day           | E. aerogenes         | E. aerogenes  | E. aerogenes                             | E. aerogenes  |
| 71  | 60     | F   | Blood    | Int. Med.  | Cerebral Hge.                | 18 day           | E. aerogenes         | E. aerogenes  | E. aerogenes                             | E. aerogenes  |
| 72  | 15 day | M   | Blood    | Nursery    | N. jaundice                  | 15 day           | S. marcescens        | S. marcescens | S. marcescens                            | S. fonticola  |
| 73  | 10 day | F   | Blood    | Nursery    | Premature                    | 10 day           | S. marcescens        | S. marcescens | S. marcescens                            | S. marcescens |
| 74  | 17 day | M   | Blood    | Nursery    | Umbilical sepsis             | 10 day           | K. spp               | K. oxytoca    | K. oxytoca                               | K. oxytoca    |
| 75  | 12 day | M   | Blood    | Nursery    | Umbilical sepsis & premature | 12 day           | K. pneumoniae        | K. pneumoniae | E. aerogenes                             | K. pneumoniae |
| 76  | 12 day | M   | Blood    | Nursery    | N. septicemia                | 10 day           | S. marcescens        | S. marcescens | S. marcescens                            | S. marcescens |
| 77  | 56     | M   | Pus      | Urology    | Nephrostomy                  | 21 day           | Unidentified         | Unidentified  | Very rare biotype "Burkholderia cepacia" | Unidentified  |
| 78  | 52     | F   | Pus      | Orthopedic | Joint prothesis              | 20 day           | P. aeruginosa        | P. aeruginosa | P. aeruginosa                            | P. aeruginosa |
| 79  | 36     | M   | Pus      | Orthopedic | Accident                     | 18 day           | P. aeruginosa        | P. aeruginosa | P. aeruginosa                            | P. aeruginosa |
| 80  | 59     | F   | Pus      | Orthopedic | Fracture neck of femur       | 20 day           | P. aeruginosa        | P. aeruginosa | P. fluorescence                          | P. aeruginosa |

| No. | Age | Sex | Specimen               | Department | Clinical diagnosis  | Duration of stay | Conventional methods                |                           | Automated methods        |                              |
|-----|-----|-----|------------------------|------------|---------------------|------------------|-------------------------------------|---------------------------|--------------------------|------------------------------|
|     |     |     |                        |            |                     |                  | Routine B.R.                        | BBL                       | Microscan                | Sensititre                   |
| 81  | 60  | F   | Pus                    | Orthopedic | Fracture hip        | 15 day           | P. other than aeruginosa            | P. fluorescence           | P. putida                | P. fluorescence              |
| 82  | 36  | M   | Pus                    | Surgery    | Accident            | 10 day           | P. aeruginosa                       | P. aeruginosa             | P. aeruginosa            | P. aeruginosa                |
| 83  | 52  | M   | Pus                    | Orthopedic | Accident            | 20 day           | gram-ve-oxidase +ve non fermenter*  | Alcaligenes xylosoxidans  | Alcaligenes xylosoxidans | Alcaligenes xylosoxidans     |
| 84  | 55  | M   | Peritoneal aspirate    | Surgery    | Cancer colon        | 15 day           | P. aeruginosa                       | P. aeruginosa             | P. aeruginosa            | P. fluorescence              |
| 85  | 46  | F   | Pus                    | Surgery    | Umbilical hernia    | 10 day           | P. aeruginosa                       | P. aeruginosa             | P. aeruginosa            | P. aeruginosa                |
| 86  | 29  | F   | Pus                    | Surgery    | Appendectomy        | 7 day            | gram-ve oxidase +ve                 | A. hydrophila             | A. hydrophila            | V.alginolyticus              |
| 87  | 43  | M   | Pus                    | Surgery    | Hernia              | 10 day           | P. other than aeruginosa            | P. fluorescence           | P. fluorescence          | P. fluorescence              |
| 88  | 66  | F   | Pus                    | Orthopedic | Fracture neck femur | 12 day           | gram -ve oxidase +ve, non fermenter | *Alcaligenes xylosoxidans | Alcaligenes xylosoxidans | Alcaligenes xylosoxidans     |
| 89  | 46  | F   | Peritoneal aspirate    | Surgery    | Hiatus hernia       |                  | P. aeruginosa                       | P. aeruginosa             | P. aeruginosa            | P. aeruginosa                |
| 90  | 66  | F   | Sputum                 | I.C.U      | Coma                | 8 day            | P. other than aeruginosa            | P. fluorescence           | P. fluorescence          | P. fluorescence<br>P. putida |
| 91  | 62  | M   | Sputum                 | I.C.U.     | C.V. strock         | 10 day           | gram -ve oxidase                    | S. maltophilia            | S. maltophilia           | S. maltophilia               |
| 92  | 57  | M   | Sputum                 | Int. Med.  | Hepatic coma        | 15 day           | P. aeruginosa                       | P. aeruginosa             | P. aeruginosa            | No identification            |
| 93  | 66  | F   | Bronchoscopic aspirate | I.C.U.     | Coma                | 12 day           | gram-ve-oxidase -ve- coccobacilli   | A. baumannii              | A. baumannii             | A. loweffii                  |

\* glucose fermenter

\* glucose non fermenter

| No. | Age     | Sex | Specimen | Department | Clinical diagnosis | Duration of stay | Conventional methods                 |                 | Automated methods |                 |
|-----|---------|-----|----------|------------|--------------------|------------------|--------------------------------------|-----------------|-------------------|-----------------|
|     |         |     |          |            |                    |                  | Routine B.R.                         | BBL             | Microscan         | Sensititre      |
| 94  | 70      | M   | Sputum   | I.C.U      | Coma               | 15 day           | gram-ve-oxidase<br>-ve               | S. maltophilia  | S. maltophilia    | S. maltophilia  |
| 95  | 38      | M   | Sputum   | I.C.U      | Accident           | 10 day           | P. aeruginosa                        | P. aeruginosa   | P. aeruginosa     | P. aeruginosa   |
| 96  | 58      | F   | Sputum   | I.C.U      | Cerebral Hge.      | 15 day           | P. aeruginosa                        | P. aeruginosa   | P. aeruginosa     | P. aeruginosa   |
| 97  | 62      | F   | Sputum   | I.C.U      | C.V. strock        | 15 day           | P. other than<br>aeruginosa          | P. fluorescence | P. fluorescence   | P. fluorescence |
| 98  | 66      | M   | Blood    | I.C.U.     | Coma               | 11 day           | gram-ve oxidase<br>-ve, coccobacilli | A. baumannii    | A. baumannii      | A. baumannii    |
| 99  | 12 days | M   | Blood    | Nursery    | N. septicemia      | 8 day            | gram-ve oxidase<br>-ve, coccobacilli | A. baumannii    | A. baumannii      | A. baumannii    |
| 100 | 10 days | M   | Blood    | Nursery    | N. septicemia      | 6 day            | gram-ve oxidase<br>-ve               | S. maltophilia  | S. maltophilia    | S. maltophilia  |

| No. | Age | Sex | Specimen | Department | Clinical diagnosis     | Duration of stay | Conventional  | BBL           |
|-----|-----|-----|----------|------------|------------------------|------------------|---------------|---------------|
| 101 | 34  | M   | Urine    | Urology    | Varicocele             | 10 day           | E. coli       | E. coli       |
| 102 | 39  | M   | Urine    | Urology    | Varicocele             | 12 day           | E. coli       | E. coli       |
| 103 | 59  | F   | Urine    | Urology    | Nephrostomy            | 15 day           | P. vulgaris   | P. vulgaris   |
| 104 | 65  | M   | Urine    | Urology    | Cancer bladder         | 20 day           | P. vulgaris   | P. vulgaris   |
| 105 | 21  | F   | Urine    | Urology    | Stone ureter           | 15 day           | E. cloacae    | E. cloacae    |
| 106 | 49  | M   | Urine    | Surgery    | Cancer colon           | 20 day           | P. mirabilis  | P. mirabilis  |
| 107 | 55  | F   | Urine    | Surgery    | Hernia                 | 15 day           | E. coli       | E. coli       |
| 108 | 37  | F   | Urine    | Surgery    | Volvulus               | 18 day           | P. mirabilis  | P. mirabilis  |
| 109 | 66  | M   | Urine    | I.C.U      | Coma                   | 18 day           | P. vulgaris   | P. vulgaris   |
| 110 | 66  | F   | Urine    | I.C.U.     | C.V. stroke            | 15 day           | P. aeruginosa | P. aeruginosa |
| 111 | 27  | F   | Urine    | Urology    | Ureteric obstruction   | 12 day           | E. coli       | E. coli       |
| 112 | 19  | F   | Urine    | Urology    | Ureteric obstruction   | 10 day           | P. vulgaris   | P. vulgaris   |
| 113 | 22  | M   | Urine    | Urology    | Hydrocele              | 10 day           | P. vulgaris   | P. vulgaris   |
| 114 | 54  | M   | Urine    | I.C.U.     | C.V. stroke            | 18 day           | E. coli       | E. coli       |
| 115 | 12  | F   | Urine    | Urology    | Ureteric obstruction   | 15 day           | E. coli       | E. coli       |
| 116 | 58  | F   | Urine    | Orthopedic | Joint prothesis        | 18 day           | E. aerogenes  | E. aerogenes  |
| 117 | 60  | F   | Urine    | Orthopedic | Joint prothesis        | 25 day           | E. aerogenes  | E. aerogenes  |
| 118 | 52  | F   | Urine    | Gyna.      | Hystrectomy            | 10 day           | E. cloacae    | E. cloacae    |
| 119 | 56  | M   | Urine    | Urology    | Cancer bladder         | 20 day           | P. vulgaris   | P. vulgaris   |
| 120 | 39  | F   | Urine    | Gyna.      | Bilateral ovarian cyst | 18 day           | K. pneumoniae | K. pneumoniae |
| 121 | 45  | M   | Urine    | I.C.U      | C.V. stroke            | 12 day           | P. vulgaris   | P. vulgaris   |
| 122 | 62  | M   | Urine    | I.C.U      | Respiratory failure    | 8 day            | E. coli       | E. coli       |

| No. | Age     | Sex | Specimen                | Department | Clinical diagnosis        | Duration of stay | Conventional                           | BBL           |
|-----|---------|-----|-------------------------|------------|---------------------------|------------------|----------------------------------------|---------------|
| 123 | 58      | M   | Urine                   | Urology    | Prostatectomy             | 15 day           | E. coli                                | E. coli       |
| 124 | 62      | F   | Pus                     | Orthopedic | Fracture neck femur       | 15 day           | P. aeruginosa                          | P. aeruginosa |
| 125 | 64      | F   | Pus                     | Orthopedic | Joint prothesis           | 18 day           | P. vulgaris                            | P. vulgaris   |
| 126 | 44      | M   | Pus                     | Orthopedic | Accident                  | 12 day           | P. aeruginosa                          | P. aeruginosa |
| 127 | 24      | F   | Pus                     | Surgery    | Appendicectomy            | 7 day            | E. cloacae                             | E. cloacae    |
| 128 | 49      | F   | Pus                     | Surgery    | Cholecystectomy           | 7 day            | E. coli                                | E. coli       |
| 129 | 60      | M   | Pus                     | Urology    | Nephrostomy               | 10 day           | P. aeruginosa                          | P. aeruginosa |
| 130 | 64      | M   | Pus                     | Orthopedic | Fracture neck femur       | 15 day           | P. aeruginosa                          | P. aeruginosa |
| 131 | 39      | F   | Pus                     | Gyna.      | Laparoscopic ex.          | 5 day            | E. cloacae                             | E. cloacae    |
| 132 | 55      | F   | Pus                     | Orthopedic | Joint prothesis           | 25 day           | P. aeruginosa                          | P. aeruginosa |
| 133 | 37      | F   | Pus                     | Orthopedic | Accident                  | 17 day           | P. aeruginosa                          | P. aeruginosa |
| 134 | 45      | M   | Pus                     | Orthopedic | Joint prothesis           | 15 day           | K. spp                                 | K. oxytoca    |
| 135 | 7 day   | F   | Umbilical swab<br>pus   | Nursery    | Septic umbilical<br>stump | 3 day            | E. coli                                | E. coli       |
| 136 | 59      | M   | Peritoneal<br>aspirate  | Surgery    | Colon carcinoma           | 20 day           | P. aeruginosa                          | P. aeruginosa |
| 137 | 68      | F   | Bed sores swab          | I.C.U      | Coma                      | 25 day           | E. aerogenes                           | E. aerogenes  |
| 138 | 10 days | M   | Umbilical swab<br>"pus" | Nursery    | Septic umbilical<br>stump | 10 day           | gram -ve, oxidase -<br>ve coccobacilli | A. baumannii  |
| 139 | 50      | M   | Pus                     | Surgery    | Colon transection         | 15 day           | P. aeruginosa                          | P. aeruginosa |
| 140 | 48      | F   | Pus                     | Surgery    | Cholecystectomy           | 10 day           | P. vulgaris                            | P. vulgaris   |

| No. | Age     | Sex | Specimen | Department | Clinical diagnosis        | Duration of stay | Conventional                          | BBL            |
|-----|---------|-----|----------|------------|---------------------------|------------------|---------------------------------------|----------------|
| 141 | 49      | F   | Pus      | Orthopedic | Joint prosthesis          | 17 day           | P. aeruginosa                         | P. aeruginosa  |
| 142 | 62      | M   | Pus      | Urology    | Cancer prostate           | 20 day           | P. aeruginosa                         | P. aeruginosa  |
| 143 | 56      | M   | Pus      | Urology    | Nephrostomy               | 22 day           | E. aerogenes                          | E. aerogenes   |
| 144 | 55      | M   | Sputum   | I.C.U      | Coma                      | 12 day           | S. marcescens                         | S. marcescens  |
| 145 | 58      | M   | Sputum   | I.C.U      | Respiratory failure       | 10 day           | S. marcescens                         | S. marcescens  |
| 146 | 55      | M   | Sputum   | Chest      | Emphysema                 | 10 day           | P. aeruginosa                         | P. aeruginosa  |
| 147 | 62      | F   | Sputum   | Chest      | Pleural effusion          | 18 day           | gram -ve, oxidase<br>-ve bacilli      | S. maltophilia |
| 148 | 65      | F   | Sputum   | I.C.U      | C.V. stroke               | 14 day           | K. pneumoniae                         | K. pneumoniae  |
| 149 | 10 days | F   | Blood    | Nursery    | N. septicemia             | 10 day           | E. coli                               | E. coli        |
| 150 | 8 days  | M   | Blood    | Nursery    | Umbilical stump<br>sepsis | 8 day            | gram -ve, oxidase<br>-ve coccobacilli | A. baumannii   |
| 151 | 10 days | M   | Blood    | Nursery    | N. septicemia             | 10 day           | K. pneumoniae                         | K. pneumoniae  |
| 152 | 12 days | F   | Blood    | Nursery    | N. septicemia             | 10 day           | K. pneumoniae                         | K. pneumoniae  |
| 153 | 55      | F   | Blood    | I.C.U      | Coma                      | 13 day           | K. pneumoniae                         | K. pneumoniae  |
| 154 | 39      | M   | Blood    | I.C.U      | Accident                  | 16 day           | E. aerogenes                          | E. aerogenes   |
| 155 | 56      | M   | Blood    | Surgery    | Partial gastrectomy       | 15 day           | P. mirabilis                          | P. mirabilis   |
| 156 | 18 day  | M   | Blood    | Nursery    | Premature                 | 18 day           | K. pneumoniae                         | K. pneumoniae  |

# Antibiotic susceptibility testing of gram negative isolates.

| Specimens | Organism     | Amikacin |   |   | Ampicillin |   |   | Cefazoline |   |   | Ceftazidime |   |   | Cefotaxime |   |   | Cefuroxime |   |   | Cefoxitin |   |   |
|-----------|--------------|----------|---|---|------------|---|---|------------|---|---|-------------|---|---|------------|---|---|------------|---|---|-----------|---|---|
|           |              | D        | M | S | D          | M | S | D          | M | S | D           | M | S | D          | M | S | D          | M | S | D         | M | S |
| 1-Urine   | E. coli      | S        | S | S | R          | R | R | R          | R | R | S           | S | S | S          | S | S | S          | S | S | S         | S | S |
| 2-Urine   | P. mirabilis | S        | S | S | R          | R | R | S          | S | S | S           | S | S | S          | S | S | S          | S | S | S         | S | S |
| 3- Urine  | P. vulgaris  | S        | S | S | R          | R | R | S          | S | S | S           | S | S | S          | S | S | S          | S | S | S         | S | S |
| 4- Urine  | K.pneumoniae | S        | S | S | R          | R | R | R          | R | R | S           | S | S | S          | S | S | R          | R | R | R         | R | R |
| 5- Urine  | E. coli      | R        | R | R | R          | R | R | R          | R | R | R           | R | R | R          | R | R | R          | R | R | R         | R | R |
| 6- Urine  | P. mirabilis | R        | R | R | R          | R | R | R          | R | R | R           | R | R | R          | R | R | R          | R | R | R         | R | R |
| 7- Urine  | E. coli      | R        | R | R | R          | R | R | R          | R | R | R           | R | R | R          | R | R | R          | R | R | R         | R | R |
| 8- Urine  | P. mirabilis | S        | S | S | R          | R | R | S          | S | S | S           | S | S | S          | S | S | S          | S | S | S         | S | S |
| 9- Urine  | P. mirabilis | S        | S | S | R          | R | R | S          | S | S | S           | S | S | S          | S | S | S          | S | S | S         | S | S |
| 10- Urine | E. coli      | S        | I | I | R          | R | R | R          | R | R | R           | R | R | R          | R | R | R          | R | R | R         | R | R |
| 11- Urine | E. coli      | S        | S | S | R          | R | R | R          | R | R | R           | R | R | R          | R | R | R          | R | R | R         | R | R |
| 12- Urine | P. mirabilis | S        | S | S | R          | R | R | R          | R | R | S           | S | S | S          | S | S | S          | S | S | S         | S | S |
| 13- Urine | E. cloacae   | R        | R | R | R          | R | R | R          | R | R | R           | R | R | R          | R | R | R          | R | R | R         | R | R |
| 14- Urine | E. coli      | R        | R | R | R          | R | R | R          | R | R | R           | R | R | R          | R | R | R          | R | R | R         | R | R |
| 15- Urine | E. coli      | S        | S | S | R          | R | R | S          | S | S | S           | S | S | S          | S | S | S          | S | S | S         | S | S |
| 16- Urine | P. mirabilis | R        | R | R | R          | R | R | R          | R | R | S           | S | S | R          | R | R | R          | R | R | R         | R | R |
| 17- Urine | E. aerogenes | S        | S | S | R          | R | R | R          | R | R | R           | R | R | R          | R | R | R          | R | R | R         | R | R |
| 18- Urine | E. coli      | R        | R | R | R          | R | R | R          | R | R | R           | R | R | R          | R | R | R          | R | R | R         | R | R |
| 19- Urine | P. vulgaris  | S        | S | S | R          | R | R | R          | R | R | S           | S | S | S          | S | S | R          | R | R | R         | R | R |
| 20- Urine | E. coli      | S        | S | S | R          | R | R | S          | S | S | S           | S | S | S          | S | S | S          | S | S | S         | S | S |

D: disk diffusion

M: Microscan Walkaway 40

S: Sensititre system

[illegible]

[illegible]

| Ciprofloxacin |   |   | Gentamycin |   |   | Imipenem |   |   | Nitrofurantoin |   |   | Ticarcillin |   |   | Piperacillin |   |   | Tetracycline |   |   | Tobramycin |   |   | Trim/sulfa |   |   |
|---------------|---|---|------------|---|---|----------|---|---|----------------|---|---|-------------|---|---|--------------|---|---|--------------|---|---|------------|---|---|------------|---|---|
| D             | M | S | D          | M | S | D        | M | S | D              | M | S | D           | M | S | D            | M | S | D            | M | S | D          | M | S | D          | M | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | R          | R | R |
| S             | S | S | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | R          | R | R | S        | S | S | R              | R | R | S           | S | S | S            | S | S | R            | R | R | R          | R | S | S          | S | S |
| S             | S | S | R          | R | R | S        | S | S | R              | R | R | S           | S | S | S            | S | S | R            | R | R | S          | S | S | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | R        | R | R | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        | S | S | R              | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S              | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        |   |   |                |   |   |             |   |   |              |   |   |              |   |   |            |   |   |            |   |   |

| Specimens  | Organism        | Amikacin |   |   | Ampicillin |   |   | Cefazoline |   |   | Ceftazidime |   |   | Cefotaxime |   |   | Cefoxitin |   |   |
|------------|-----------------|----------|---|---|------------|---|---|------------|---|---|-------------|---|---|------------|---|---|-----------|---|---|
|            |                 | D        | M | S | D          | M | S | D          | M | S | D           | M | S | D          | M | S | D         | M | S |
| 41- Pus    | E. cloacae      | S        | S | S | R          | R | R | R          | R | R | S           | S | S | S          | S | S | R         | R | R |
| 42- Pus    | K.pneumoniae    | S        | S | S | R          | R | R | R          | R | R | R           | R | R | R          | R | R | R         | R | R |
| 43- Pus    | E. aerogenes    | S        | S | S | R          | R | R | R          | R | R | S           | S | S | S          | S | S | S         | S | S |
| 44- Pus    | P. vulgaris     | S        | I | I | R          | R | R | R          | R | R | R           | R | R | R          | R | R | R         | R | R |
| 45- Pus    | E. cloacae      | S        | S | S | R          | R | R | R          | R | R | S           | S | S | S          | I | I | R         | R | R |
| 46- Pus    | M. morganii     | R        | R | R | R          | R | R | R          | R | R | R           | R | R | R          | R | R | R         | R | R |
| 47- Pus    | Prov. rettgerii | R        | R | R | R          | R | R | R          | R | R | R           | R | R | R          | R | R | R         | R | R |
| 48- Pus    | E. aerogenes    | S        | S | S | R          | R | R | R          | R | R | R           | R | R | R          | R | R | R         | R | R |
| 49- Pus    | E. coli         | S        | S | S | R          | R | R | S          | S | S | S           | S | S | S          | S | S | S         | S | S |
| 50- Pus    | E. cloacae      | S        | S | S | R          | R | R | R          | R | R | S           | S | S | S          | R | R | R         | R | R |
| 51- Pus    | E. aerogenes    | R        | R | R | R          | R | R | R          | R | R | R           | R | R | R          | R | R | R         | R | R |
| 52- Pus    | P. vulgaris     | S        | S | S | R          | R | R | R          | R | R | S           | S | S | S          | S | S | R         | R | R |
| 53- Pus    | S. marcescens   | R        | R | R | R          | R | R | R          | R | R | S           | S | S | S          | R | R | R         | R | R |
| 54- Sputum | S. marcescens   | R        | R | R | R          | R | R | R          | R | R | R           | R | R | R          | R | R | R         | R | R |
| 55- Sputum | M. morganii     | R        | R | R | R          | R | R | R          | R | R | R           | R | R | R          | R | R | R         | R | R |
| 56- Sputum | K. pneumoniae   | S        | S | S | R          | R | R | R          | R | R | R           | R | R | R          | R | R | R         | R | R |
| 57- Sputum | E. cloacae      | S        | S | S | R          | R | R | R          | R | R | S           | S | S | S          | I | I | R         | R | R |
| 58- Sputum | K. pneumoniae   | S        | S | S | R          | R | R | R          | R | R | S           | S | S | R          | R | R | S         | S | S |
| 59- Sputum | K. oxytoca      | R        | R | R | R          | R | R | R          | R | R | S           | S | S | R          | R | R | R         | R | R |
| 60- Sputum | K. pneumoniae   | S        | S | S | R          | R | R | R          | R | R | S           | S | S | R          | R | R | S         | S | S |

| Ciprofloxacin |   |   |  | Gentamycin |   |   |  | Imipenem |   |   |  | Ticarcillin |   |   |  | Piperacillin |   |   |  | Tetracycline |   |   |  | Tobramycin |   |   |  | Trim/sulfa |   |   |  |
|---------------|---|---|--|------------|---|---|--|----------|---|---|--|-------------|---|---|--|--------------|---|---|--|--------------|---|---|--|------------|---|---|--|------------|---|---|--|
| D             | M | S |  | D          | M | S |  | D        | M | S |  | D           | M | S |  | D            | M | S |  | D            | M | S |  | D          | M | S |  | D          | M | S |  |
| S             | S |   |  | R          | R | R |  | S        | S |   |  | S           | S |   |  | R            | R | R |  | R            | R | R |  | R          | R | R |  | S          | S |   |  |
| R             | R | R |  | R          | R | R |  | S        | S |   |  | R           | R | R |  | R            | R | R |  | R            | R | R |  | R          | R | R |  | R          | R | R |  |
| S             | S |   |  | R          | R | R |  | S        | S |   |  | R           | R | R |  | R            | R | R |  | R            | R | R |  | R          | R | R |  | R          | R | R |  |
| R             | R | R |  | R          | R | R |  | S        | S |   |  | R           | R | R |  | R            | R | R |  | R            | R | R |  | R          | R | R |  | R          | R | R |  |
| R             | R | R |  | R          | R | R |  | S        | S |   |  | R           | R | R |  | R            | R | R |  | R            | R | R |  | R          | R | R |  | R          | R | R |  |
| R             | R | R |  | R          | R | R |  | S        | S |   |  | R           | R | R |  | R            | R | R |  | R            | R | R |  | R          | R | R |  | R          | R | R |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S | S |  | S            | S | S |  | S          | S | S |  | S          | S | S |  |
| S             | S |   |  | S          | S | S |  | S        | S |   |  | S           | S | S |  | S            | S |   |  |              |   |   |  |            |   |   |  |            |   |   |  |

[illegible]

| Ciprofloxacin |   |   | Gentamycin |   |   | Imipenem |   |   | Ticracillin |   |   | Piperacillin |   |   | Tetracycline |   |   | Tobramycin |   |   | Trim/sulfa |   |   |
|---------------|---|---|------------|---|---|----------|---|---|-------------|---|---|--------------|---|---|--------------|---|---|------------|---|---|------------|---|---|
| D             | M | S | D          | M | S | D        | M | S | D           | M | S | D            | M | S | D            | M | S | D          | M | S | D          | M | S |
| S             | S | S | R          | R | R | R        | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | R          | R | R | R        | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | R          | R | R | S        |   | S | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | R          | R | R | R        | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        |   | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| S             | S | S | S          | S | S | S        | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| S             | S | S | S          | S | S | S        | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| S             | S | S | R          | R | R | S        |   | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| S             | S | S | R          | R | R | S        | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| S             | S | S | R          | R | R | S        |   | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | R        | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | S        |   | S | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | R          | R | R | S        | S | S | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | R        | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | R        | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | S          | S | S | S        | S | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | R        | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |
| S             | S | S | R          | R | R | S        |   | S | S           | S | S | S            | S | S | S            | S | S | S          | S | S | S          | S | S |
| R             | R | R | R          | R | R | R        | R | R | R           | R | R | R            | R | R | R            | R | R | R          | R | R | R          | R | R |

[illegible]

[illegible]

| No. | Specimen | Organism      | AK | SAM | Amp | AMC | FAZ | CAZ | CTX | CXM | FOX | CIP | CN | IPM | F | PRL | TIC | TE | TOB | SXT |
|-----|----------|---------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|---|-----|-----|----|-----|-----|
| 101 | Urine    | E. coli       | S  | R   | R   | S   | R   | S   | S   | R   | R   | S   | S  | S   | R | R   | R   | R  | S   | R   |
| 102 | Urine    | E. coli       | R  | R   | R   | R   | R   | R   | R   | R   | R   | R   | R  | R   | R | R   | R   | R  | R   | R   |
| 103 | Urine    | P. vulgaris   | S  | R   | R   | R   | R   | S   | S   | R   | R   | S   | R  | S   | R | S   | S   | S  | R   | R   |
| 104 | Urine    | P. vulgaris   | S  | R   | R   | R   | R   | R   | R   | R   | R   | R   | R  | S   | R | R   | R   | R  | R   | R   |
| 105 | Urine    | E. cloacae    | S  | R   | R   | R   | R   | R   | R   | R   | R   | S   | R  | S   | R | R   | R   | R  | R   | R   |
| 106 | Urine    | P. mirabilis  | S  | S   | R   | S   | S   | S   | S   | S   | S   | S   | S  | S   | R | S   | R   | R  | S   | R   |
| 107 | Urine    | E. coli       | S  | S   | R   | S   | S   | S   | S   | S   | S   | S   | S  | S   | R | S   | R   | R  | S   | R   |
| 108 | Urine    | P. mirabilis  | S  | S   | R   | R   | S   | S   | S   | S   | S   | S   | S  | S   | R | S   | R   | R  | S   | R   |
| 109 | Urine    | P. vulgaris   | S  | R   | R   | R   | R   | S   | S   | R   | R   | S   | R  | S   | R | S   | S   | S  | R   | R   |
| 110 | Urine    | P. aeruginosa | S  | R   | R   | R   | R   | R   | R   | R   | R   | R   | R  | S   | R | R   | R   | R  | R   | R   |
| 111 | Urine    | E. coli       | S  | R   | R   | S   | R   | S   | S   | S   | S   | S   | S  | S   | R | S   | S   | S  | S   | S   |
| 112 | Urine    | P. vulgaris   | S  | R   | R   | S   | R   | S   | S   | R   | R   | S   | S  | S   | R | S   | S   | R  | S   | S   |
| 113 | Urine    | P. vulgaris   | R  | R   | R   | R   | R   | R   | R   | R   | R   | R   | R  | S   | R | R   | R   | R  | R   | R   |
| 114 | Urine    | E. coli       | S  | S   | S   | S   | S   | S   | S   | S   | S   | S   | S  | S   | S | S   | S   | S  | S   | R   |
| 115 | Urine    | E. coli       | S  | R   | R   | R   | R   | S   | S   | S   | S   | S   | S  | S   | R | S   | R   | S  | S   | R   |
| 116 | Urine    | E. aerogenes  | S  | R   | R   | R   | R   | R   | R   | R   | R   | S   | R  | S   | R | R   | R   | R  | R   | R   |
| 117 | Urine    | E. aerogenes  | R  | R   | R   | R   | R   | R   | R   | R   | R   | R   | R  | R   | R | R   | R   | R  | R   | R   |
| 118 | Urine    | E. cloacae    | S  | S   | R   | S   | S   | S   | S   | S   | S   | S   | S  | S   | R | S   | R   | R  | S   | S   |
| 119 | Urine    | P. vulgaris   | S  | R   | R   | R   | R   | S   | S   | R   | R   | S   | S  | S   | R | S   | S   | S  | S   | S   |
| 120 | Urine    | K. pneumoniae | S  | R   | R   | R   | R   | R   | R   | R   | R   | R   | R  | S   | R | R   | R   | R  | R   | R   |

| No. | Specimen            | Organism             | AK | SAM | Amp | AMC | FAZ | CAZ | CTX | CXM | FOX | CIP | CN | IPM | F | PRL | TIC | TE | TOB | SXT |
|-----|---------------------|----------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|---|-----|-----|----|-----|-----|
| 121 | Urine               | <i>P. vulgaris</i>   | S  | S   | R   | R   | R   | S   | S   | S   | R   | R   | S  | S   | R | R   | R   | R  | S   | S   |
| 122 | Urine               | <i>E. coli</i>       | S  | R   | R   | S   | R   | S   | S   | S   | S   | S   | S  | S   | R | S   | S   | S  | S   | S   |
| 123 | Urine               | <i>E. coli</i>       | R  | R   | R   | R   | R   | R   | R   | R   | R   | R   | R  | S   | R | R   | R   | R  | R   | R   |
| 124 | Pus                 | <i>P. aeruginosa</i> | S  | R   | R   | R   | R   | R   | R   | R   | R   | R   | R  | S   |   | R   | R   | R  | R   | R   |
| 125 | Pus                 | <i>P. vulgaris</i>   | S  | R   | R   | R   | R   | R   | R   | R   | R   | R   | R  | S   |   | R   | R   | R  | R   | R   |
| 126 | Pus                 | <i>P. aeruginosa</i> | S  | R   | R   | R   | R   | R   | R   | R   | R   | S   | R  | S   |   | S   | S   | R  | R   | R   |
| 127 | Pus                 | <i>E. cloacae</i>    | S  | R   | R   | R   | R   | S   | S   | S   | R   | R   | R  | S   |   | R   | R   | R  | S   | R   |
| 128 | Pus                 | <i>E. coli</i>       | S  | S   | R   | S   | S   | S   | S   | S   | S   | S   | S  | S   |   | S   | S   | S  | S   | S   |
| 129 | Pus                 | <i>P. aeruginosa</i> | S  | R   | R   | R   | R   | R   | R   | R   | R   | R   | R  | S   |   | R   | R   | R  | R   | R   |
| 130 | Pus                 | <i>P. aeruginosa</i> | S  | R   | R   | R   | R   | R   | R   | R   | R   | R   | S  | S   |   | S   | R   | R  | S   | R   |
| 131 | Pus                 | <i>E. cloacae</i>    | S  | S   | R   | S   | R   | S   | S   | R   | R   | S   | S  | S   |   | S   | S   | R  | S   | R   |
| 132 | Pus                 | <i>P. aeruginosa</i> | I  | R   | R   | R   | R   | R   | R   | R   | R   | R   | R  | S   |   | R   | R   | R  | R   | R   |
| 133 | Pus                 | <i>P. aeruginosa</i> | S  | R   | R   | R   | R   | R   | R   | R   | R   | R   | R  | S   |   | R   | R   | R  | R   | R   |
| 134 | Pus                 | <i>K. oxytoca</i>    | R  | R   | R   | R   | R   | S   | S   | R   | R   | S   | S  | S   |   | S   | S   | R  | S   | S   |
| 135 | Pus "US"            | <i>E. coli</i>       | S  | R   | R   | R   | S   | S   | S   | S   | S   | S   | S  | S   |   | S   | S   | S  | S   | S   |
| 136 | Peritoneal aspirate | <i>P. aeruginosa</i> | S  | R   | R   | R   | R   | R   | R   | R   | R   | S   | R  | S   |   | R   | R   | R  | R   | R   |
| 137 | Bed sores swab      | <i>E. aerogenes</i>  | S  | R   | R   | R   | R   | S   | S   | S   | S   | S   | R  | S   |   | R   | R   | R  | R   | R   |
| 138 | Pus "US"            | <i>A. baumannii</i>  | S  | R   | R   | R   | R   | S   | S   | R   | R   | S   | R  | S   |   | S   | S   | R  | R   | R   |

| No. | Specimen | Organisms             | AK | SAM | AMP | AMC | FAZ | CAZ | CTX | CXM | FOX | CIP | CN | IPM | F | PRL | TIC | TE | TOB | SXT |
|-----|----------|-----------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|---|-----|-----|----|-----|-----|
| 139 | Pus      | <i>P. aeruginosa</i>  | S  | R   | R   | R   | R   | S   | S   | S   | R   | S   | R  | S   |   | S   | S   | R  | R   | R   |
| 140 | Pus      | <i>P. vulgaris</i>    | R  | S   | R   | R   | R   | S   | S   | S   | S   | S   | R  | S   |   | R   | R   | R  | R   | R   |
| 141 | Pus      | <i>P. aeruginosa</i>  | R  | R   | R   | R   | R   | R   | R   | R   | R   | S   | R  | S   |   | I   | R   | R  | R   | R   |
| 142 | Pus      | <i>P. aeruginosa</i>  | S  | R   | R   | R   | R   | R   | R   | R   | R   | R   | R  | I   |   | R   | R   | R  | R   | R   |
| 143 | Pus      | <i>E. aerogenes</i>   | S  | R   | R   | R   | R   | R   | R   | R   | R   | S   | S  | S   |   | R   | R   | R  | S   | R   |
| 144 | Sputum   | <i>S. marcescens</i>  | R  | R   | R   | R   | R   | S   | S   | R   | R   | S   | R  | S   |   | R   | R   | R  | R   | R   |
| 145 | Sputum   | <i>S. marcescens</i>  | R  | R   | R   | R   | R   | S   | S   | R   | R   | S   | R  | S   |   | R   | R   | R  | R   | R   |
| 146 | Sputum   | <i>P. aeruginosa</i>  | S  | R   | R   | R   | R   | R   | R   | R   | R   | S   | R  | R   |   | S   | R   | R  | R   | R   |
| 147 | Sputum   | <i>S. maltophilia</i> | S  | R   | R   | R   | R   | R   | R   | R   | R   | R   | R  | S   |   | R   | R   | R  | R   | R   |
| 148 | Sputum   | <i>K. pneumoniae</i>  | S  | R   | R   | R   | R   | R   | R   | R   | R   | S   | R  | S   |   | R   | R   | R  | R   | R   |
| 149 | Blood    | <i>E. coli</i>        | S  | R   | R   | S   | R   | S   | S   | R   | R   | S   | S  | S   |   | S   | S   | R  | R   | R   |
| 150 | Blood    | <i>A. baumannii</i>   | S  | R   | R   | S   | R   | S   | S   | S   | S   | S   | S  | S   |   | S   | S   | S  | S   | R   |
| 151 | Blood    | <i>K. pneumoniae</i>  | S  | S   | R   | R   | S   | S   | S   | S   | S   | S   | S  | S   |   | S   | S   | S  | S   | R   |
| 152 | Blood    | <i>K. pneumoniae</i>  | S  | R   | R   | R   | R   | S   | S   | S   | S   | S   | S  | S   |   | S   | S   | R  | R   | R   |
| 153 | Blood    | <i>K. pneumoniae</i>  | R  | R   | R   | R   | R   | R   | R   | R   | R   | R   | R  | S   |   | R   | R   | R  | R   | R   |
| 154 | Blood    | <i>E. aerogenes</i>   | S  | R   | R   | R   | R   | S   | S   | S   | R   | S   | R  | S   |   | R   | R   | R  | R   | S   |
| 155 | Blood    | <i>P. mirabilis</i>   | S  | S   | S   | S   | R   | S   | S   | S   | S   | S   | R  | S   |   | S   | R   | R  | S   | R   |
| 156 | Blood    | <i>K. pneumoniae</i>  | S  | R   | R   | R   | R   | S   | S   | S   | S   | S   | S  | S   |   | S   | S   | R  | S   | R   |

AK: Amikacin  
 CTX: Cefotaxime  
 F: Nitrofurantoin  
 PRL: Piperacillin  
 CAZ: Ceftazidime  
 IPM: Imipenem  
 SXT: Trimethoprim/sulfamethoxazole  
 FAZ: Cefazolin  
 CN: Gentamycin  
 TOB: Tobramycin  
 AMC: Amoxicillin/clavulanic acid  
 CIP: Ciprofloxacin  
 TE: Tetracycline  
 AMP: Ampicillin  
 SAM: Ampicillin/sulbactam  
 CXM: Cefuroxime  
 FOX: Cefoxitin  
 TIC: Ticarcillin

Data of patients yielding gram positive isolates.

| No. | Age    | Sex | Specimen       | Department | Clinical diagnosis   | Duration of stay | Conventional identification | Microscan Walkaway    | Sensititre            |
|-----|--------|-----|----------------|------------|----------------------|------------------|-----------------------------|-----------------------|-----------------------|
| 1   | 58     | M   | Pus            | Orthopedic | Joint prosthesis     | 15 day           | Staphylococcus aureus       | Staphylococcus aureus | Staphylococcus aureus |
| 2   | 62     | F   | Pus            | Orthopedic | Fracture neck femur  | 17 day           | Staphylococcus aureus       | Staphylococcus aureus | Staphylococcus aureus |
| 3   | 65     | M   | Pus            | Orthopedic | Fracture neck femur  | 21 day           | Staphylococcus aureus       | Staphylococcus aureus | Staphylococcus aureus |
| 4   | 48     | M   | Pus            | Surgery    | Hernia               | 9 days           | Staphylococcus aureus       | Staphylococcus aureus | Staphylococcus aureus |
| 5   | 10 day | M   | Umbilical swab | Nursery    | N. septicemia        | 8 days           | Staphylococcus aureus       | Staphylococcus aureus | Staphylococcus aureus |
| 6   | 13 day | M   | Umbilical swab | Nursery    | N. septicemia        | 13 day           | Staphylococcus aureus       | Staphylococcus aureus | Staphylococcus aureus |
| 7   | 13 day | F   | Blood          | Nursery    | Premature            | 13 day           | Staphylococcus aureus       | Staphylococcus aureus | Staphylococcus aureus |
| 8   | 15 day | M   | Blood          | Nursery    | Premature            | 15 day           | Staphylococcus aureus       | Staphylococcus aureus | Staphylococcus aureus |
| 9   | 11 day | M   | Blood          | Nursery    | N. jaundice          | 10 day           | Staphylococcus aureus       | Staphylococcus aureus | Staphylococcus aureus |
| 10  | 61     | M   | Blood          | I.C.U      | Coma                 | 13 day           | Staphylococcus aureus       | Staphylococcus aureus | Staphylococcus aureus |
| 11  | 55     | F   | Blood          | I.C.U      | C.V. stroke          | 15 day           | Staphylococcus aureus       | Staphylococcus aureus | Staphylococcus aureus |
| 12  | 16     | F   | Urine          | Urology    | Ureteric obstruction | 10 day           | Staphylococcus aureus       | Staphylococcus aureus | Staphylococcus aureus |
| 13  | 34     | F   | Urine          | Urology    | Ureteric obstruction | 12 day           | Staphylococcus aureus       | Staphylococcus aureus | Staphylococcus aureus |
| 14  | 35     | F   | Sputum         | Chest      | Pleural effusion     | 8 days           | Staphylococcus aureus       | Staphylococcus aureus | Staphylococcus aureus |
| 15  | 48     | M   | Pus            | Surgery    | Neck abscess         | 7 days           | Staphylococcus aureus       | Staphylococcus aureus | Staphylococcus aureus |
| 16  | 19     | M   | Pus            | Surgery    | Appendectomy         | 6 days           | Staphylococcus aureus       | Staphylococcus aureus | Staphylococcus aureus |
| 17  | 37     | F   | Pus            | Gyna.      | Laparoscopy          | 7 days           | Staphylococcus aureus       | Staphylococcus aureus | Staphylococcus aureus |
| 18  | 39     | F   | Pus            | Gyna.      | Laparoscopy          | 5 days           | Staphylococcus aureus       | Staphylococcus aureus | Staphylococcus aureus |
| 19  | 31     | F   | Urine          | Urology    | Ureteric obstruction | 11 day           | Coagulase -ve staphylococci | Staph. epidermidis    | Staph. epidermidis    |
| 20  | 16     | M   | Urine          | Urology    | Ureteric obstruction | 10 day           | Coagulase -ve staphylococci | Staph. epidermidis    | Staph. epidermidis    |
| 21  | 24     | F   | Urine          | Urology    | Renal stone          | 15 day           | Coagulase -ve staphylococci | Staph. saprophyticus  | Staph. saprophyticus  |
| 22  | 44     | F   | Urine          | Gyna.      | Hysterectomy         | 8 days           | Coagulase-ve staphylococci  | Staph. saprophyticus  | Staph. saprophyticus  |

| No. | Age    | Sex | Specimen            | Department | Clinical diagnosis        | Duration of stay | Conventional identification | Microscan Walkaway                  | Sensititre                          |
|-----|--------|-----|---------------------|------------|---------------------------|------------------|-----------------------------|-------------------------------------|-------------------------------------|
| 23  | 62     | M   | Urine               | Urology    | Prostatectomy             | 14 day           | Coagulase-ve staphylococci  | Staph. epidermidis                  | Staph. epidermidis                  |
| 24  | 33     | F   | Urine               | Urology    | Ureteric stricture        | 11 day           | Coagulase-ve staphylococci  | Staph. hominis, sub-species hominis | Staph. hominis, sub-species hominis |
| 25  | 57     | M   | Urine               | Urology    | Cancer bladder            | 27 day           | Coagulase-ve staphylococci  | * Staph. xylosus (V.R)              | No identification                   |
| 26  | 21     | F   | Pus                 | Surgery    | Appendectomy              | 5 day            | Coagulase-ve staphylococci  | Staph. hominis sub-species hominis  | Staph. hominis, sub-species hominis |
| 27  | 59     | F   | Pus                 | Orthopedic | Fracture hip & neck femur | 15 day           | Coagulase-ve staphylococci  | * Staph. cohnii (V.R)               | Staphylococcal species              |
| 28  | 10 day | F   | Blood               | Nursery    | Premature                 | 10 day           | Coagulase-ve staphylococci  | Staph. epidermidis                  | Staph. epidermidis                  |
| 29  | 60     | M   | Blood               | Int. Med   | Hepatic coma              | 13 day           | Coagulase-ve staphylococci  | Staph. epidermidis                  | Staph. epidermidis                  |
| 30  | 62     | F   | Blood               | I.C.U      | Coma                      | 10 day           | Coagulase-ve staphylococci  | Staph. epidermidis                  | Staph. epidermidis                  |
| 31  | 48     | F   | Urine               | Urology    | Stone ureter              | 11 day           | Coagulase -ve Staph         | Staph. epidermidis                  | Staph. epidermidis                  |
| 32  | 37     | M   | Urine               | Urology    | Cancer bladder            | 13 day           | Coagulase -ve Staph.        | Staph. epidermidis                  | Staph. epidermidis                  |
| 33  | 58     | M   | Pus                 | Surgery    | Appendectomy              | 5 days           | Coagulase -ve Staph.        | Staph. hominis sub-species hominis  | Staph. hominis sub-species hominis  |
| 34  | 18     | F   | Urine               | Urology    | Ureteric obstruction      | 10 days          | Coagulase-ve Staph.         | Staph. saprophyticus                | Staph. saprophyticus                |
| 35  | 52     | F   | Urine               | Gyna.      | Hysterectomy              | 9 days           | Coagulase-ve Staph.         | Staph. epidermidis                  | Staph. epidermidis                  |
| 36  | 48     | M   | Urine               | Urology    | Varicocele                | 10 day           | Enterococcus                | Enterococcus faecalis               | Enterococcus faecalis               |
| 37  | 52     | F   | Urine               | Surgery    | Colostomy                 | 12 day           | Enterococcus                | Enterococcus faecalis               | Enterococcus faecalis               |
| 38  | 18     | F   | Pus                 | Surgery    | Appendectomy              | 5 day            | Enterococcus                | Enterococcus faecalis               | Enterococcus faecalis               |
| 39  | 58     | F   | Peritoneal aspirate | Surgery    | Umbilical hernia          | 12 day           | Enterococcus                | Enterococcus faecalis               | Enterococcus faecalis               |
| 40  | 47     | F   | Urine               | Urology    | Ureteric stricture        | 9 days           | Enterococcus                | Enterococcus faecalis               | Enterococcus faecalis               |
| 41  | 48     | M   | Blood               | I.C.U      | Trauma to the head        | 8 day            | *Strept pneumoniae          | Strept. pneumoniae                  | Strept. pneumoniae                  |
| 42  | 56     | F   | Sputum              | Chest      | Pleural effusion          | 10 day           | Strept. pneumoniae          | Strept. pneumoniae                  | Strept. pneumoniae                  |
| 43  | 12 day | M   | Blood               | Nursery    | N. septicemia             | 7 day            | Strept. pneumoniae          | Strept. pneumoniae                  | Strept. pneumoniae                  |
| 44  | 65     | F   | Sputum              | I.C.U      | C.V. stroke               | 10 days          | Strept. pneumoniae          | Strept. pneumoniae                  | Strept. pneumoniae                  |

\* V.R.: Very rare biotype