Pseudomonas aeruginosa is a classic opportunist pathogen with innate resistant to many antibiotics and disinfectants. This organism survives in various environments in nature and in homes and hospitals. Because of the ubiquitous nature of Pseudomonas aeruginosa, transmission of this organism to humans can occur in variety of ways. It is physiologically versatile and flourishes as a saprophyte in warm moist situations in the human environment, including sink, drains, respirators, humidifiers and disinfectant solutions. Pseudomonas fluorescens, Pseudomonas putida, Pseudomonas stutzeri also are environmental inhabitants but they are much less commonly found in clinical specimens than is Pseudomonas aeruginosa. The other Pseudomonads and Brevundimonas spp. also are environmental organisms. Because they are rarely encountered in patient specimens, the mode of transmission to humans remains uncertain. Isolation of Pseudomonas aeruginosa from healthy carriers or environmental sites is significant only when there is a risk of transfer to compromised patient, e.g. by nurses’ hands or via respirators.

Normally, the human faecal carrier rate for Pseudomonas aeruginosa is less than 10%; however, carrier rates increase with the length of stay of patients in hospital, reaching 30% after 3 week, and this represents a distinct risk of endogenous infection. Faecal isolation frequencies of Pseudomonas aeruginosa increase dramatically in patients in hospital (rates up to 60%), and are closely correlated with the length of stay. Of the species in these two genera Pseudomonas aeruginosa is the most thoroughly studied with regard to infections in humans. Although this organism is an environmental inhabitant, it is also very successful opportunistic pathogen. It produce an over whelming infections which is due to an arsenal of virulence factors. Many extra cellular virulence factors secreted by Pseudomonas aeruginosa have been shown to be controlled by a complex regulatory circuit involving cell-to-cell signaling
system that allow the bacteria to produce these factors in a co-ordinated, cell-density dependant manner.\(^5\) Virulence determinants on pathogenic *Pseudomonas aeruginosa*: Adhesin- fimbria (N. methyl-phenylalanine pilli), polysaccharide capsule (glycocalyx), alginate slime (biofilm). Invasins-elastase, alkaline protease, hemolysins (phospholipase, lecithinase), cytotoxin (leukocidin), siderophores and siderophore uptake system, Pyocyanin-diffusible pigment. Motility/chemotaxis-flagella. Toxins-exoenzyme S, exotoxin A, lipopolysaccharide. Antiphagocytic surface properties-capsule, slime layer LPS. Defense against serum bactericidal reaction-slime layer, capsule, protease enzymes, LPS. Defense against immune responses-capsule, slime layers, protease enzymes. Genetic attributes-genetic exchange by transduction and conjugation, inherent drug resistance, R factors and drug resistance plasmids.\(^6\)

In patients with no clinical evidence of infection, isolation of *Pseudomonas aeruginosa*, particularly in association with other resistant organisms such as *Candida*, can be a consequence of selection by antibiotic therapy and of little direct clinical relevance. Infections due to *Pseudomonas aeruginosa* are seldom encountered in healthy adults but in the last two decades the organism has become increasingly recognized as the aetiological agent in a variety of serious infections in hospitalized patients with impaired immune defences\(^7\) including human immunodeficiency virus infection.\(^8\) Colonization is often iatrogenic and associated with prior instrumentation e.g. catheterization, tracheostomy, etc. *Pseudomonas aeruginosa* is most feared cause of corneal ulceration, hence great care must be taken in maintenance and cleaning of contact lenses.\(^9\) Despite the emphasis on caution in assessing the clinical significance of *Pseudomonas aeruginosa*, there are undoubtedly occasions when serious infections occur. Panophthalmitis can result in partial blindness or loss of an eye. The organism is the major cause of malignant otitis media. Endocarditis and septicaemia caused by *Pseudomonas aeruginosa* is rela-
tively rare but carries a mortality rate exceeding 70% in patients compromised by severe burns, cancer or drug addiction. The most significant pathogenic role for *Pseudomonas aeruginosa* at present is in the chronic debilitating pulmonary infections due to mucoid variants that are now the major cause of death in patients with cystic fibrosis.\textsuperscript{10} Even with the variety of potential virulence factors discussed; *Pseudomonas aeruginosa* remains an opportunistic pathogen that requires compromised host defenses to establish infection. In normal, healthy host, infection is usually associated with events that disrupt or bypass protection provided by epidermis. The result is infections of the skin, bone, heart or eye. *Pseudomonas aeruginosa* is a notable cause of nosocomial infections of respiratory and urinary tract, wounds, blood stream, and even the central nervous system. For immunocompromised patients, such infections are often serious and frequently life-threatening.\textsuperscript{2} *Pseudomonas aeruginosa* shows high level of intrinsic resistance to a number of structurally unrelated antimicrobial agents and these results in increased illness, deaths, and health care cost.

The virtual nonexistence of antibiotic policies and guidelines in our country to help clinicians make rational choices with regard to antibiotic treatment is a major driver of the emergence and spread of multidrug resistance in India. Regular monitoring and documentation of resistance is therefore crucial in developing strategies to control infections due to these bacteria in patients admitted particularly in intensive care units.

Assessment of the significance of a particular episode or outbreak of *Pseudomonas aeruginosa* infection, and selection of the most appropriate management procedures, require knowledge and appreciation of both the organism and the host. This can be achieved by consultations between microbiologist and clinician that take account of the patient’s clinical status, the factors responsible for susceptibility to infection and any virulence factor exhibited by the particular strain of the organism.
*Pseudomonas aeruginosa* being the major cause of human illness particularly in hospitalized patients and lack of information on the prevalent types responsible for various infections in this area of Gujarat, prompted us to undertake “Microbiology and Epidemiology Studies of *Pseudomonas aeruginosa* with special Emphasis on Nosocomial Infections.”