

# Infectious Disease and Antimicrobial Agents the Best Way to Use a Limited Resource



**Luisetto M\***

European Specialist in Lab Medicine, Italy

**Submission:** October 06, 2017; **Published:** November 21, 2017

**\*Corresponding author:** Luisetto M, Applied Pharmacologist, European Specialist in Lab Medicine, Hospital Pharmacist Manager, Italy, Email: mauro65@gmail.com

**Keywords:** Infectious diseases; Antimicrobial agents; Clinical outcomes; Pharmaceutical industry; Drug design; Delivery systems

## Introduction

We can see today some critically conditions in field of infectious disease therapy: Few new class molecules introduced in therapy, MDR and other serious resistances rapidly expanding Abuse or misuse of some parenteral antimicrobial out of hospital settings, new infectious disease epidemic Situations and limited economic resource level to be assigned to infectious disease pathology for the public institutions.

The same we observe in example the high efficacy of some antiviral therapy as in HEPATIT C and the role in reducing also the liver transplant needs. (pharmacology vs surgery strategies). High cost but high efficacy.

The high rate in relapses in some condition [1] or inefficacy due by rapid resistances diffusion need new strategies in drug design and drug re-design in order to improve ADME PROFILE, drug delivery systems or Modify (in dynamics or other mechanism) able to improve the real efficacy other drugs we have today available.

Perhaps the creativity approach without too much bureaucracy can give the right results in this times in order to discover or improve new or classic pharmacological strategy. We have seen in last 2 centuries many discovering in antimicrobial drug class (1850-1970) and due I many time to unexpected effect or by errors. (*Penicillium notatum* other examples) [2].

The severe infectious disease are imply often in high mortality rate in ICU and in other critical wards and the clinical pharmacists role can improve this specific rate [3,4] by adding a more rational decision making system in antimicrobials use.

Many antimicrobials are also associated with resistance pattern and all this condition need an efficacy strategy to best use this clinical resource we have today.

A misuse or abuse in this approach results in dangerous situation related to severe infectious disease we can see today (killer bacteria- superbugs). The critical clinical patient conditions require often the less nephrotoxic drugs (but with high efficacy): Saving life drugs must be used with the best decision making systems and this can results in improving patient survival . (The multidisciplinary gives more results vs monodiscipl. Medical team).

To do this in the right way is needed multidisciplinary equipments [3] with added medicinal chemistry competences to correctly set the problem under the light of the different discipline (clinicians, pharmaceuticals, biologists, statisticians et other involved).

The association of clinical pharmacy and medicinal chemistry competence also at single researcher level can contribute to overtake the failure in some antimicrobial strategy.

## We Can Observe Some Literature Involved in Infectious Disease Clinical Pharmacy

### According article, infectious disease pharmaceutical care

The Role of the Clinical hospital Pharmacists to Improve Clinical Outcomes 2017 "Today more than past we need to improve clinical outcomes in the management of infectious disease pathology and drug therapy related to critical patient (septic shock, sepsis, MOF, invasive fungal infections, HIV, peritonitis, meningitis, endocarditis, osteomyelitis, pneumonia, severe UTI, leukemia and many other condition). The same way we can see the high efficacy of some new pharmacological molecules in eradicate severe infectious (in example EPATITIS C), saving the HIGH cost for transplant involved. This condition needs today a more active role and permanent presence of

clinical hospital pharmacist in medical team because these kind of pharmacological therapies highly involved in patient's health" [2].

And as reported In article The Clinical Pharmacist Competence as Pharmaceutical Drug Design Tool "The hospital clinical pharmacist specific competences added to medicinal chemistry-pharmaceutical knowledge and expertise are efficacy instruments to translate to the big pharmaceutical industries the modification of pharmacological-drugs molecule or the need to search new strategy in drug therapy if not efficacy as request"[5]. Also in surgery field the role played by clinical pharmacist is relevant [6] in field of example the antimicrobial surgery prophylaxis.

According Basak et al. [7] "We hereby conclude that the early detection and close monitoring of MDR, XDR, or even PDR bacterial strains must be started by all clinical microbiology laboratories to reduce the menace of antimicrobial resistance which is now a global problem" [7].

According Bond et al. [8] a multivariate mathematics regression analysis, controlling for severity of illness, was employed to determine the associations. 4 clinical pharmacy services were associated with a lower mortality rates: clinical research ( $p<0.0001$ ), his is the first study to indicate that both centrally based and patient-specific clinical pharmacy services are associated with a reduced hospital mortality rates. This suggests that these clinical ph. services save a significant n. of lives in our hospitals [8].

Gentry CA et al. [9] written that the clinical outcomes and the cost-effectiveness analysis of an antimicrobial control program (ACP) were verified. The ACP program was associated with a 2.4-day decrease in length of stay and a reduction in mortality from 8.28% (control) to 6.61% (intervention) ( $p=0,01$ ). Inpatient pharmacy costs other than iV antimicrobials decreased an average of only 5.7% over the two program years, but the acquisition cost of IV antimicrobials drugs for both program years yielded a total cost reduction of 30.8%. An ACP program directed by clinical pharmacist trained in infectious diseases was associated with improvements in inpatient length of stay and mortality. The ACP program decreased intravenous antimicrobial costs and facilitated the approval process for restricted and non- formulary antimicrobial [9].

Bond et al. [8] showed that tended to have the greatest association with reductions in mortality rate. As the clinical pharmacist staffing levels increased from the tenth percentile level (0.34/100 occupied beds) to the ninetieth percentile (3.23/100 occupied beds) level, hospital deaths declined from 113/1000 to 64/1000 admissions (with 43% decline) (reduction of 395 deaths/hospital/year when clinical pharmacist staffing went from the tenth to the ninetieth percentile).

Reduction of 1.09 deaths/day/hosp. having clinical pharmacy service staffing between these staffing levels, or 320 dollars

of pharmacist salary cost/death averted. This variables were associated with reduced length of stay in 1024 hospitals: the drug protocol management (slope -1.30,  $p=0.008$ ), pharmacist participation on medical rounds (slope -1.71,  $p<0.001$ ), and number of clinical pharmacists/occupied bed (slope -26.59,  $p<0.001$ ).

It was finded that As drug costs/occupied bed/year increased, severity of illness-adjusted mortality rates decreased (slope -38609852, R(2) 8.2%,  $p<0.0001$ ) and that As the total cost of care/occupied bed/year increased, those same mortality rates decreased (slope -5846720642, R(2) 14.9%,  $p<0.0001$ ). Seventeen clinical pharmacy services were associated with improvements in the four variables" [10].

Luisetto M et al. [11] in 2017 reported "Today we need to rethink the actual model to discover new pharmacological molecules and drugs and reintroducing the same methods used in the period 1860-1970 to have new really efficacy drug classes and pharmacological strategies .

The clinical pharmacists and pharmaceutical competences added to the specific medicinal chemistry knowledge applied also in small research laboratory can give more clinical results to be translated to the industrial pharmacy settings.

Creativity added to the medicinal chemistry competences and the know how of the clinical pharmacist and the other clinicians can give right strategy to introduce drugs whit really efficacy (not only me too drugs). The new algorithm must be in the first step of discovering process not to go on in registration procedure of not really efficacy pharmacological molecules (or drugs) only due by economic purpose but only related to the patients clinical outcomes goal.

The same (after registration process) the drugs re-design of the molecule to improve the clinical efficacy must require a low level in burocracy as possible. (Respecting the ethical principle and the patient safety)

Creativity added to the single level of health care researcher activity must not to be compressed by a too much burocratic systems level or to a business affairs systems too much oriented to the business-economic results [11].

In a lancet infection disease meta-analysis was reported that our findings of beneficial effects on outcomes with nine antimicrobial stewardship objectives suggest they can guide the steward shipequips in their efforts to improve the quality of antibiotic use in hospitals settings [12].

## Discussion and Conclusion

The Infectious disease and antimicrobial agent use imply deep knowledge and expertise in this field by medical team and clinical pharmaceutical care principle can complete the clinicians works in more rational way (in example Preserving the activity of some critical drugs from MDR diffusion [7] or to

provide new molecular modifying strategies to introduce more efficacy drugs.

We think that using the methods of the researcher in 1800-1900 in their laboratory without a lot of bureaucratic rules we can obtain more relevant pharmacological molecules to introduce in therapy today.

We can think also that a more rapid process in improving some chemical characteristics of some drugs

Is today requested and this can be reached also by single research level.

This work must be favored by registrative institution in an acceptable toxicity risk level in order to have more chances in drug discovering and re-designing. Every scientific discipline present good achievement but often failure and what is relevant is the way chosen to have a more rational response in the management of some vital antimicrobial agents in example deeply introducing the medicinal chemistry and clinical pharmacy discipline in clinical setting.

### References

1. Luisetto M, Nili-Ahmadabadi B (2017) Chronic prostatitis: The clinical pharmacist role and new delivery systems. *J Bioanal Biomed* 9: 2.
2. Luisetto M (2017) Infectious disease pharmaceutical care: The role of the clinical pharmacists to improve clinical outcomes 2017. *J Antimicrob Agents* 3: 143.
3. Nili-Ahmadabadi B, Luisetto M, Nili-Ahmadabadi H, Nasser H, Mashori GR, et al. (2016) Clinical impact of pharmacist presence in ICU medical team on mortality rate. *Clinicians Teamwork* 1: 15-33.
4. Luisetto M (2017) The Clinical Pharmacists Main Focus. *J Antimicrob Agents* 3: 2.
5. Luisetto M, Nili-Ahmadabadi B (2017) The Clinical pharmacist competence as pharmaceutical drug -research & reviews: *Journal of Hospital and Clinical Pharmacy Design Tool*.
6. Luisetto M (2016) Pharmaceutical care in surgery field. *J Pharma Care Health Sys* 3: 3.
7. Basak S, Priyanka S, Monali R (2016) Resistant and extensively drug resistant bacteria: A Study. *Journal of Pathogens* 2016(2016): 5.
8. Bond CA, Raehl CL, Franke T (1999) Clinical pharmacy services and hospital mortality rates. *Pharmacotherapy* 19(5): 556-564.
9. Gentry CA, Greenfield RA, Slater LN, Wack M, Huycke MM (2000) Outcomes of an antimicrobial control program in a teaching hospital. *Am J Health Syst Pharm* 57(3): 268-274.
10. Bond CA, Raehl CL, Franke T (2001) Interrelationships among mortality rates, drug costs, total cost of care, and length of stay in United States hospitals: summary and recommendations for clinical pharmacy services and staffing. *Pharmacotherapy* 21(2): 129-141.
11. Luisetto M (2017) The laboratory right dimension in drug design and efficacy pharmacological molecule modify strategy-New Algorithm. behzadnili, goulammashorimodern approach in drug design 2017 designing.
12. Schuts EC, Hulscher ME, Mouton JW, Verduin CM, Stuart JW, et al. (2016) Current evidence on hospital antimicrobial stewardship objectives: A systematic review and meta-analysis. *Lancet Infect Dis* 16(7): 847-856



This work is licensed under Creative Commons Attribution 4.0 License  
DOI: [10.19080/AIBM.2017.07.555710](https://doi.org/10.19080/AIBM.2017.07.555710)

### Your next submission with Juniper Publishers will reach you the below assets

- Quality Editorial service
- Swift Peer Review
- Reprints availability
- E-prints Service
- Manuscript Podcast for convenient understanding
- Global attainment for your research
- Manuscript accessibility in different formats  
( Pdf, E-pub, Full Text, Audio)
- Unceasing customer service

Track the below URL for one-step submission

<https://juniperpublishers.com/online-submission.php>