

## Management Instrument in Pharmaceutical Care and Clinical Pharmacy

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### Abstract

In actual scenario of international economic cycle, rational use of drugs and medical devices has become a real priority in order to correctly use the limited economic resources available today. Healthcare government and public or private institutions, insurance company and other subject are involved in high costs management much more than past (in example cost for drugs, medical devices and, new diagnostic procedure). Healthcare managers ask the clinical pharmacist professionals to rationalize costs involved in new innovative therapy, due to medical therapy errors and also in order to have efficient logistic systems (hospital pharmacy). For this reason Clinical pharmacist every day work in healthcare setting are strongly applied to monitor high costs related to diagnostics procedures and drug therapies. But Clinical pharmacists professional need to have management instruments to be added to their classic university core curriculum (Knowledge and practice applications). A rational use of clinical pharmacist's human resource is a golden endpoint in every setting with the change from logistic to more clinical function (clinical pharmaceutical care new healthcare discipline).

According to ASHP Guidelines report: "clinical pharmacy service, in which pharmacist provide direct patient care are important foundation for successful medication utilization management program focused on managing drug cost" in this article we analyze biomedical literature involved giving some elements for improving management skills to be active part of medical team in management and monitoring costs. (Clinical pharmacist help physicians in this kind of work) clinical pharmacy competence added to management instruments can be considered the right keyword and a synergy.

**Keywords:** Clinical pharmacy; Clinical pharmaceutical care; Management; ICT; Human resource skills; Pharmacoeconomy; Healthcare systems; Cost containment; Business administration

### Introduction

Meggison has written that management is a mix of science and art: but this is real condition also for clinical pharmacist so we think that also for clinical pharmacist University course and practical application are the right tools to adequately manage healthcare costs in efficiently way (Knowledge and practical applications) [1].

"A management tool can be defined as an entity of instruments to support implementation of concepts and ideas at all levels of conceptualization and realization, of concepts, ultimately aiming to support organizational processes." [2].

The classic theory of management by Fayol includes the following

- Planning,
- Organizing,
- Commanding (leading),
- Coordinating,
- Controlling,
- Staffing, budgetting, reporting (Gulick).

### Historical Theories of Management

Scientific Management Theory (1890-1940) by F. W. Taylor,

Bureaucratic M. Theory (1930-1950) by Max Weber,

Administrative Theory by H. Fayol,

Human Relations Movement (1930-today) by E. Mayo,

X&Y Theory by Douglas McGregor.

### Contemporary theories

Contingency Theory, Systems Theory by Ludwig von Bertalanffy, Chaos Theory.

### Management skills include

- Conceptual and diagnostic attitude to analyze complex situations, appropriate responses to a situation.
- Political attitude to build a power, to create connections.
- Interpersonal skills to communicate, motivate, mentor and delegate, leadership, ability to lead groups.
- Technical skills to expertise in one's specifically functional area.
- Communication skills (ICT), professional social media.

**Organization:** General management, marketing division, administrative, technical, logistic, human resource, Mission, vision.

**Planning:** Middle-long term, programming in short term.

**Business management:** Governance system used to achieve goals (Strategic planning, budget reporting gaps analysis) Healthcare and management efficacy, economic efficiency.

**Decision making systems:** Identify problem, search information

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(official and not), choose the goal; evaluate alternative decision, do check. Different level top managers, middle, low manager (technical competencies are more requested in low level, conceptual Ability are more request in top management).

**Steps planning:** Set objectives, generate alternatives, evaluate, monitor, and obtain high level of commitment by stakeholders.

**Problem solving and creative solution:** Disciplines model (USA army during II world war) established the team, describe the problem implement and verify, root causes, choose corrective action and verify prevent recurrent, share knowledge

## Material and Methods

This work has substantially an observational approach, we have analyzed the corpus of actual clinical pharmacy and pharmaceutical care university course in order to verify if are present or not autonomous management discipline.

Then we observed some management instrument useful for pharmacy Care practice and some pub med literature involved in pharmaceutical and health care costs management.

## Results

### Actual situation of the Universities of clinical pharmacy

Analyzing the actual course in clinical pharmacy and we noticed that management theory and practice are not present in the ordinary clinical pharmacy course as autonomous discipline (even if pharmacoeconomy is regularly studied into classic clinical pharmacy postgraduate course).

### From literature point of view

In healthcare management field “extremely complex health care organizations, by their structure and organization, operate in a constantly changing business environment, and such situation implies and requires complex and demanding health management. Therefore, in order to manage health organizations in a competent manner, health managers must possess various managerial skills and be familiar with problems in health care. Research, identification, analysis, and assessment of health management education and training needs are basic preconditions for the development and implementation of adequate programs to meet those needs... The need for knowledge of certain areas in health management, as well as the need for mastering concrete managerial competencies has been recognized as top-priorities requiring additional improvement and upgrading.” [3].

“Healthcare managers of the future will need to be prepared to accept greater accountability for the quality and efficiency of healthcare. National and state scorecards on health system performance indicate wide variation across the U.S. and across hospitals and health systems on key dimensions of performance including health outcomes, quality, access, equity, and efficiency. Benchmark data on achievable performance will be useful to healthcare managers in identifying best practices, setting priorities for improvement, and closing gaps in performance. Payment reforms are likely to reward healthcare organizations that serve as patient-centered medical homes, or assume accountability for total acute care, including hospital readmissions and post-hospital care. Health reforms to extend affordable health insurance to all, align financial incentives to enhance value and achieve savings, organize the healthcare system around the patient to ensure that care is accessible and coordinated, assist providers in meeting and

raising benchmarks for high-quality, efficient care, and support greater public-private collaboration are needed to set the U.S. health system on a path to high performance.” [4].

“The multidisciplinary nature of health care management requires the use of resources from diverse fields. Based on the data provided by this study, practitioners should have access to general business, applied psychology, health services research, and health policy journals, as well as health care management titles.” [5].

“Although management practices are recognized as important factors in improving health care quality and efficiency, most research thus far has focused on individual practices, ignoring or underspecifying the contexts within which these practices are operating. Research from other industries, which has increasingly focused on systems rather than individual practices, has yielded results that may benefit health services management.

Our goal was to develop a conceptual model on the basis of prior research from health care as well as other industries that could be used to inform important contextual considerations within health care.

We reviewed relevant research from peer-reviewed and other industry-relevant sources to inform our model. The model we developed was then reviewed with a panel of practitioners, including experts in quality and human resource management, to assess the applicability of the model to health care settings. The resulting conceptual model identified four practice bundles, comprising 14 management practices as well as nine factors influencing adoption and perceived sustainability of these practices. The mechanisms by which these practices influence care outcomes are illustrated using the example of hospital-acquired infections. In addition, limitations of the current evidence base are discussed, and an agenda for future research in health care settings is outlined. Results may help practitioners better conceptualize management practices as part of a broader system of work practices. This may, in turn, help practitioners to prioritize management improvement efforts more systematically.” [6].

“The overwhelming number of knowledge management (KM) tools on the market today and the hype surrounding them makes it difficult for knowledge managers to know which tools will provide them with the best KM value. Knowledge managers have to develop mechanisms and strategies for how best to implement and use KM tools and technologies. Using an exploratory focus group comprised of knowledge managers from a number of different organizations, this study explores the relationship between KM and technology and identifies the strategies knowledge managers use to successfully recognize where and how technology should be implemented and used to facilitate knowledge management work. Our results support the existing KM literature by highlighting the importance of delivering KM tools on a solid foundation of information technology (IT) and information management (IM) infrastructure.

Further, KM tools work best for different tasks and work groups; therefore, understanding which tool is most appropriate for the use context is critical. We also gain an understanding of the strategies that KM managers use for successful implementation and use of KM tools. These strategies embody the following principles like experimentation, iteration, adaptation of grassroots technologies and building on what works. The findings from this study suggest that when knowledge managers use these strategies for deploying KM tools, delivering success and business value from KM is much more likely.” [7].

“The model of clinical pharmacy practice adopted by many

pharmacy department hospitals is no longer appropriate for the demands of today's health-care services. Reviews many new models proposed for clinical pharmacy practice including an integrated model for providing a pharmaceutical care management approach in the health-care system. This model is a response to the failures of traditional drug therapy. It is primarily an idea about how health professionals and patient should integrate their work to obtain outcomes important to patients and clinicians." [8].

"A novel clinical pharmacy management system developed by our hospital was introduced to improve the work efficiency of clinical pharmacists in our hospital and to carry out large sample statistical analyzes by providing pharmacy information services and promoting rational drug use. Clinical pharmacy management system was developed according to the actual situation. Taking prescription review in the department of general surgery as the example, work efficiency of clinical pharmacists, quality and qualified rates of prescriptions before and after utilizing clinical pharmacy management system were compared... Qualified rates of both the inpatient and outpatient prescriptions of the general surgery department increased, and the use of antibiotics decreased. This system apparently improved work efficiency standardized the level and accuracy of drug use, which will improve the rational drug use and pharmacy information service in our hospital. Meanwhile, utilization of prophylactic antibiotics for the aseptic operations also reduced." [9].

Hospital information system is widely used to improve work efficiency of hospitals in China. However, it is lack of the function providing pharmaceutical information service for clinical pharmacists. A novel clinical pharmacy management system developed by our hospital was introduced to improve the work efficiency of clinical pharmacists in our hospital and to carry out large sample statistical analyzes by providing pharmacy information services and promoting rational drug use. Clinical pharmacy management system was developed according to the actual situation. Taking prescription review in the department of general surgery as the example, work efficiency of clinical pharmacists, quality and qualified rates of prescriptions before and after utilizing clinical pharmacy management system were compared. Statistics of 48,562 outpatient and 5776 inpatient prescriptions of the general surgical department were analyzed. Qualified rates of both the inpatient and outpatient prescriptions of the general surgery department increased, and the use of antibiotics decreased. This system apparently improved work efficiency standardized the level and accuracy of drug use, which will improve the rational drug use and pharmacy information service in our hospital. Meanwhile, utilization of prophylactic antibiotics for the aseptic operations also reduced [10].

"We think that core training must include principles of Management, ICT Professional social media, psychological behavior skills for team working added to be added to the classic clinical pharmacy programs." [11].

"While in PubMed and other biomedical databases, we can rapidly find articles, in social media we can rapidly find both articles and very fine details about the authors and researchers. Researchers by publically sharing their expertise and experience, can not only network with each other, but also initiate new opportunities in multidisciplinary work, even on a long distance fashion. Nowadays, it is widespread to observe scientists in different sectors can study problems from different disciplines and thus what you have is a multidisciplinary outlook. Although these social network machines have reduced the time factor, to a light speed, which is certainly relevant to such process, still there

is room for, and it is necessary, for such an instrument to engage in further improvements and developments." [12].

And in clinical pharmacy management field, "Patients with type 2 diabetes who received pharmacist-led pharmaceutical care in an outpatient diabetes clinic experienced reduction in A1c at 6 months compared with essentially no change in the usual care group. Six of 8 secondary biomarkers were improved in the intervention group compared with usual care." [10]. "Clinical pharmacy involvement in hypertension management resulted in increased BP control. Loss of long-term control after discontinuation of clinical pharmacy management supports a change in care processes that prevent patients from being lost to follow-up." [13].

The application of pharmaceutical care principle in practice settings can improve clinical outcomes, reducing therapy errors and containment cost [14]. Deep knowledge in management theory and instruments, and practice application can give positive results in clinical outcomes and also in reducing therapy errors and cost containment [15].

### Priority area to cover and instruments

Costs involved in drug therapy, due to therapy errors, in drugs and medical devices logistics, Cost avoided in improving clinical outcomes (clinical pharmacist in stabile way in medical team)

### Classic economical assessment and managerial instrument useful for clinical pharmacist

Principle of pharmaco-healthcare economics, business administration, Strategic management cost analysis (cost-benefit, cost efficacy, cost effectiveness, analytical way), budget impact and control, rational resource allocation, benchmarking.

### Approach models

Systematic, or by project, team or task force models (high expensive or high budget impact therapy). Knowledge and Change management, HR management, communications strategy, conflict management. MBO, project management, time management, Total quality management (Problem solving, lateral thinking, SWOT analysis) ICT management (software and hardware), professional social media Process organization by function, gerarchic, matrix). Risk assessment, Total quality management, customer satisfaction data collection systems and analysis, documentation activity (access to medical patient data).

### Specifically oriented pharmacy service instrument

Medication cost management (drugs, medical devices, *in vitro* diagnostics and other).

### Clinical pharmacy instruments

Evidence based criteria, dose unit systems (example to reduce waste), automatized robots, informatics drugs prescription systems. ward clinical pharmacy service with advanced training in cost management, Sterile unit pharmacy drug therapy monitoring, ADR monitoring, Drugs interactions, Patients Drug and medical history TDM-pharmacokinetics, toxicology, medical laboratory data, imaging data (monitoring drug therapy) drug day (ex to reduce waste), IV OS switch (to reduce cost), IV waste reduction drug rotation (expiration day first in-first out), check list use (emergency). Committee participation (ethical and other as infectious disease, clinical risk, nutritional team) continuous medical updating activity, Lifelong learning clinical

pharmacy procedure and protocols following rational drug use policy (antimicrobials, oncologic, MABS, antiviral, haemo derivate, expensive medical devices and other), antiseptic rotation, sterile procedure, isolation, vaccines, antimicrobial prophylaxis and other risk management strategy, Medication use safety, coaching activity to other professional healthcare and students Pharmaceutical care management, and Ward clinical pharmacy service assessment patient need care plan (modify or new interventions, change strategy requested) patient information sharing in medical equip follow up activity documenting activity Pharmaceutical chemistry, Structure activity relationship, clinical pharmacology, toxicology knowledge Classic and innovative drugs Epidemiology, etiology m, pathology, statistics, clinical studies clinical chemistry, molecular biology knowledge, Imaging-nuclear medicine Clinical cases, clinical and diagnostics patients data. Clinical audit antimicrobial stewardship, MDR management Medication therapy review MTM Therapy monitoring, compliance evaluation, Patient Counselling Preventive measure (isolation, washing hand, sterile gloves and other).

Clinical Rotations skills in clinical and surgery wards: Onco hematology, Nephrology and dialysis, gastroenterology, cardiology, neurology, pulmonary med. Critical care Psychiatric pharmacy Care, Metabolic disease and pharmacy Care, Pain management, Pediatric and geriatric, long term care, Gynecology, pregnancy and obstetrics pharmacy Care, ambulatory care and other.

### High costs or critical drug and medical devices class management

Haemoderivates, antimicrobials, oncologic, biologic drugs, antidiabetics, Generics, bio similar drugs, Nutrition support, Medical devices and diagnostics *in vitro*, antiseptics and Disinfectants, contrast agents, radio diagnostics, Medicinal gas and other.

### Administrative rules

Generic Drug intensive use, bio similar drug budgeting, formulary management, drug restriction policy, Regulatory affairs, administrative law Ethical committee rules, infectious disease committee.

Appropriateness, regulatory rules (central reimbursement classification, administrative prescribing limitation) centralized buying strategy, centralized logistic Legal implications management (therapy errors and insurance policy). Observing the management science we can find classic discipline to be applied by clinical pharmacist practitioner.

- Business administration (business plan, budget control, Financier patrimonial, technical and human resource, accounting activity, business management, costs analysis: fixed, variable, direct and non-direct, high costs diseconomy management).
- Project management (scope, costs, quality, time, resource, constraints, risks, monitoring).
- Knowledge management, (learning organization) Cook and J.S. Brown Bridging epistemologies explicit and tacit knowledge, Know how, Formal and non-formal communication.
- ICT management: new professional social media, communication strategy.
- Strategic management Goals, prioritizing, Mission vision governance, strategy and tactics, planning, swot analysis,

make or buy, benchmarking problem solving lateral thinking, creativity, Reengineering core competences, outsourcing, competitive comparing strategy, core competencies, Scenario and Contingency Planning, strategy alliance, supply chain management, acquisitions (Outsourcing, make or buy, long term, medium, short term strategy).

- Change management (in public and private administration) bureaucracy administration, process business reengineering.
- Operative *Management line and staff, Gerarchic, functions, matrix systems, Performance analysis.*

Lean production input output, Planned or not planned decision, decision making systems. Ambient rumors, not sayed reality

MBO, pareto analysis, Goal setting, General management can use interference in formal, key performance indicators, organization.

- Time management (the to do list, The Eisenhower Method, delegate, Prioritize activity).
- HR management and governance coaching conflict management, team working ability, team leadership, cooperation, Team leadership, proactivity, empowerment, Team: formal and informal.

Staffing: develop human resource, Formal and non-formal chief (in some cases workers listen real expert eve in different from official chief), Human resource evaluation: knowledge, competence, motivation, HR Selection, evaluation, salary policy, administration, reward policy, penalize measure, interpersonal links formal or not formal, Butler Waldroop 4 dimensions of relational work influence, interpersonal facilitation, relational creativity, team leadership.

- Healthcare management.
- Communication management.
- Total quality management, PDCA cycle, kaizen, Kayrio, Muda, Just in time, diagnostic (procedure). Statistical performance analysis.
- Risk management (healthcare) errors, near miss event, risk assessment, incident reporting, root causes analysis, FMECA customer relationship, Market analysis Financial and Strategic marketing, Customer satisfaction (targeting, statistical analysis, segmentation).

Technology using techniques from mathematical modeling, statistical analysis, optimization, operations research arrives at optimal or better solutions to complex decision-making problems. (Instrument currently used in industrial engineering, operative management, and organization science was Originating in military field since before World War II)Operational researchers must determine which techniques is the most appropriate instrument for improvement decision making strategy under constraints, time limits or economical resource). Skills, knowledge added with practical experience.

### Psychological and behavior skills

Problem solving, lateral thinking, chunking problems, focus on solution, creativity, brainstorming, open mind, collaborative working group (team, central pharmacy, hospital management).

Flexibility, to say no ability, Decision making in all situation, independence.

Leadership style: directive, supportive, participative, achievement oriented (HOUSE).

Stress management (mindfulness, resilience and other) coping strategy change strategy if not results.

Rethinking problems, searching help, take time ability to give response, communication skills, mental training, and no extreme thinking, lose comfort zone, Perseverance, resilience, self-motivation, self-control, critical thinking, and zero thinking ability.

Learning by errors, lifelong learning attitude, Serenity, assertively, positive vision.

Leadership, cooperation, Coaching, mental training, resistance to change.

Four strategic types: defender, prospector, analyzer, reactor (Miles, Snow).

## Conclusion

As indicated in literature analyzed in this work there is the need to improve healthcare systems introducing classic management instruments starting from clinical pharmacist university course. This entire management instrument must be added to EBM criteria in pharmaceutical care working activities [16-19].

The clinical pharmacist presence in stable way in medical team give general positive effects in clinical outcomes, cost containment and reducing therapy errors. Some management theory is useful, and must to be post under right light in order to efficiently manage the system.

- Business administration and management knowledge (currently offered in dedicated Master or other school after postgraduate degree but we think that introduction of an independent discipline of business administration principle and management during university period can give a more expertise useful to have a more effectiveness systems).
- New ICT instruments can give relevant contribute in management systems and in the same way Professional social media can be considered today an useful tool to meet between researcher and healthcare professional and a bases for a new kind of biomedical database (In professional social media we can find researcher curriculum, professional interest and other relevant information and an efficient systems to meet themselves) (Network economy KELLY), sharing economy [20-22].
- Psychological behavior skills for team working.

Theory and practical applications added to be added to the classic clinical pharmacy programs.

We submit to the scientific community the request to introduce this management instruments in current clinical pharmacist post graduated course at the same time we ask to public institution to strongly apply this new approach.

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