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ROLE OF CLINICAL PHARMACIST IN A HOSPITAL SETTING A COMPREHENSIVE REVIEW ARTICLE

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Abstract:

Background: *50 Years ago, clinical pharmacy looked nothing like it does now. Instead of just handing the medications, the field shifted focus toward caring for people. One big shift came when pharmacists moved into hospitals. There, they became key members of care teams. Because of their presence, treatment plans improved. Safety around medications strengthened too. Decisions about drugs started considering both results and expense. Their input helps balance effectiveness with spending. Patient outcomes took priority over old routines.*

Objective: *This review is a comprehensive analysis of the diverse roles of clinical pharmacists in different hospital departments and how they contribute to medication management, adverse drug reaction monitoring, patient counselling, antimicrobial stewardship, pharmacovigilance and clinical research*

Methods: *Through a narrative approach, sources emerged from searches in PubMed, Scopus, Google Scholar, along with WHO records. Trials assigned at random, forward-looking observation efforts, organized summaries, also official guidelines appearing from 2000 up to 2025 found their way into the pool. Topic fit decided inclusion - examples include pharmacists stepping in during hospital stays, clinic visits, or critical care moments.*

Results: *Medication mistakes happen less often when clinical pharmacists get involved. Better results from treatment pop up across many studies. Hospital stays tend to shrink because of their input. Costs in health care take a dip too. In antimicrobial programs, their role makes numbers shift in clear ways. Watching for drug side effects becomes more effective with them around. Managing long-term illnesses sees real changes thanks to their work. Different groups of patients show these gains plainly.*

Conclusion: *The contemporary hospital cannot do without clinical pharmacists. To ensure that they provide quality, safe, and equitable patient care, expanding their scope of practice, which is aided with strong policies and proper workforce planning, is crucial.*

Keywords: *Clinical pharmacist; hospital pharmacy; medication reconciliation; antimicrobial stewardship; pharmacovigilance; patient counselling; medication errors; pharmacy practice.*

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1.INTRODUCTION:

During the 1960s, the United States formally recognized clinical pharmacy as a distinct area of study, driven by growing acknowledgment that pharmacists carried skills useful well beyond simply handing out medications. Because of insight into their capabilities, these professionals began stepping more fully into direct patient support roles. Support from the World Health Organization has played a steady part in expanding how pharmacists contribute within healthcare frameworks. When it comes to using medicines wisely, pharmacy practices are now seen as essential groundwork. Within hospitals, clinical pharmacists work alongside doctors, nursing staff, nutrition experts, and others - shaping treatment plans so each person receives medication that works, fits safely, and delivers real results.

The cost of medication-induced damage is great. An influential report by WHO estimated one death per day and 1.3 million injuries per year in the United States alone due to medication errors, and the same pattern has been reported worldwide. Implementation of clinical pharmacists into the point of care has been demonstrated to prevent a large percentage of these errors prior to reaching the patient and lower the morbidity and mortality rates as well as the economic cost involved.

Doctor of Pharmacy (Pharm.D) in India.The Pharmacy Council of India has formally defined clinical pharmacy training and established hospital-based clinical pharmacists as a professional cadre through D.) programme that has been introduced in 2008. Even with this development, the role of the clinical pharmacist is still not well known to healthcare administrators, policymakers, and the general population in most of the low and middle income countries (LMICs). The purpose of this review is to synthesize existing evidence and have a comprehensive description of the various roles played by clinical pharmacists in the hospital.

2. HISTORICAL PERSPECTIVE AND EVOLUTION OF CLINICAL PHARMACY

Back in 1990, Hepler and Strand reshaped how people saw pharmacy work through an idea called pharmaceutical care. That shift placed the pharmacist in charge of making sure medicine use led to real improvements - like better days for patients. Instead of focusing on mixing drugs, handing them out, or tracking supplies, they began stepping closer to those receiving treatment. Where once their role stayed behind the scenes, it slowly moved into conversations and decisions alongside individuals needing help.

From U.S. teaching hospitals, the push for clinical pharmacy began - pharmacists joining patient visits, checking prescriptions, offering expert advice. Slowly it spread into Europe, then reached Australia, followed years later by parts of Asia and Africa. Today, under FIP recognition, clinical pharmacy stands as a distinct specialty, demanding deep knowledge in drug therapy, how drugs move through the body, and decisions guided by solid research. [6]

Back in places such as India, the role of clinical pharmacists started shifting once the Pharm.D. path opened up. Teaching hospitals tied to state systems began placing students into rotations across departments - think internal medicine, surgical units, children's care, intensive settings, cancer treatment areas. Real patient cases meet classroom knowledge during these rounds. Skills form slowly, shaped by daily decisions at the bedside. A new kind of pharmacist is taking shape because of it.[4]

3. MEDICATION MANAGEMENT AND PRESCRIPTION REVIEW

A key duty of hospital clinical pharmacists involves checking medicine prescriptions closely - errors like improper drug selection, dose issues, harmful interactions, clashes with existing illnesses, or repeated therapies often come up. Such problems pop into view when treatments do not align well with patient needs. Research inside large hospitals reveals that expert pharmacy reviews uncover meaningful medication errors in roughly every eighth to third prescription examined. The numbers underline how common slip-ups can be without close monitoring. Matching a person’s current medicines against new orders whenever care shifts - whoever manages it - is vital work. Mistakes tend to emerge most when patients move between units, enter facilities, or leave them. One wide-reaching analysis appearing in the Annals of Internal Medicine showed fewer than half as many mismatches occurred at entry if pharmacists handled comparisons instead of relying only on routine nursing checks.

Starting with blood level data, clinical pharmacists adjust medications that have a small safety margin - such as aminoglycosides, vancomycin, phenytoin, digoxin, and lithium - in line with how each individual processes drugs. Because of pharmacist-led therapeutic monitoring, patients tend to experience fewer toxic effects, spend less time in hospitals, and generate lower antibiotic costs across health systems.

4. PREVENTION AND DETECTION OF MEDICATION ERRORS

Wrong medicines rank among the preventable harms patients face in hospitals. Severity levels - from almost harmful to fatal - form categories defined by NCC MERP. Within hospital areas like wards or ICUs, clinical pharmacists act during key

phases: ordering, copying, preparing, giving drugs. Their presence reduces risk before mistakes reach a patient.

One analysis by Khalil et al., covering 66 separate studies, found pharmacist involvement led to far fewer prescription errors - drops ranged between 55% and 96%, depending on context and method used. When it comes to children, calculating doses by weight raises risks; yet, a pharmacist reviewing those numbers can block serious overdoses before they happen.

Wrong use of certain strong medicines - like blood thinners, insulin, powerful salts, painkillers, and cancer treatments - can seriously hurt patients. Rules for using these drugs safely come from clinical pharmacists, who also train hospital teams. Oversight happens often, led by those same experts, ensuring practices stay on track. Follow-up checks happen regularly because mistakes carry big consequences

5. ADVERSE DRUG REACTION MONITORING AND PHARMACOVIGILANCE

Adverse drug reactions (ADRs) are a major cause of hospital stays that last longer than they should and admissions to the hospital. About 5–7% of all hospital admissions are thought to be caused by ADRs, and they cause or contribute to death in 0.1% of medical patients and 0.01% of surgical patients. [12] Working inside hospitals, clinical pharmacists help spot harmful reactions to medicines. Because they understand drugs well, these professionals report problems found during treatment. Their involvement strengthens safety tracking systems meant to catch medication risks early. Through careful observation, reporting follows naturally as part of daily practice. Not every team includes such specialists, yet their presence improves response accuracy. In many cases, findings lead directly to changes in patient care routines.

Most of the work behind India's drug safety tracking happens through hospitals sharing reports on adverse reactions. CDSCO oversees this system, known as PvPI, shaping alerts based on real-world patient data. People trained in clinical pharmacy often lead these efforts, using structured methods to assess causality. Instead of guesswork, they apply frameworks such as the WHO-UMC method or the Naranjo checklist. Their role helps ensure each report is clear, consistent, stored properly. Information flows upward - to national records - sometimes reaching global monitoring networks too. [13]

Most of the time, watching for problems after drugs are used is routine. Yet here's where things shift - pharmacists step in, digging through medical records themselves. Instead they talk directly with doctors when something looks off about a medicine's effect. Because they know how bodies process chemicals, plus genetic differences in responses, their judgments stand apart. Unlike others on the team, they weigh interactions using detailed digital tools. This helps tell real side effects apart from symptoms that just happen at the same time. Risk plans often start right there, shaped by their analysis.

6. ANTIMICROBIAL STEWARDSHIP PROGRAMMES

Around the world, germs that resist medicines have become a major danger to people's health lately. Using antibiotics wrong – like picking strong types too often, giving too little, or continuing treatment longer than needed – pushes these resistant strains to grow. Experts agree hospital efforts to manage drug use carefully can help fix this problem.Working closely with patients, pharmacists hold an essential position within these care teams, say top experts on infections.

Day by day, those working as pharmacists within antibiotic oversight teams review medication orders to see if hospital guidelines are being met. As soon as pathogen details arrive from testing labs, they frequently propose switching treatment to narrow-spectrum agents rather than broad alternatives.Their input also guides changes from IV delivery to oral forms, helping patients leave the hospital sooner. Evidence shows such initiatives – typically run or shared by pharmacy clinicians – are linked to a drop in broad-spectrum drug usage, measured at 20–40% fewer defined daily doses. Patient recovery trends remain stable under these models, even as rates of Clostridioides difficile decline across settings where they operate. At the same time, healthcare facilities see lower spending tied to antibiotic use

Where specialist oversight is scarce – common across rural and regional medical centers worldwide – pharmacists often step into the stewardship role by default. Reviewing treatments after they start, offering guidance on usage, then sharing knowledge with those who prescribe becomes part of their routine. Though not always planned, these actions shape how drugs are used in such environments.

7. PATIENT COUNSELLING AND MEDICATION EDUCATION

Most people stick to their treatment plans when they know what each medicine does. Right from arrival, a clinical pharmacist sits down with them to go over prescriptions one by one. When something new gets added to the list, another talk happens - timing matters just as much as dosage. Trouble spots like missed doses or odd reactions come up often, so

clarification steps in early. By the time discharge rolls around, there's usually a review session tucked into the process. Knowing which symptom means wait versus which needs urgent care makes a difference later on. Each conversation builds clearer understanding without relying on guesswork at home.[16]

Most people face tough moments when leaving hospital for home. Studies keep showing that when pharmacists guide patients at discharge, fewer return within thirty days - especially those managing multiple medicines, heart issues, breathing conditions like COPD, or blood thinners. These talks go through each medicine's name and job. How much to take, plus exactly when, becomes clear. Patients learn what reactions might show up. Warnings about food mixing into treatment pop up too. Ways to handle inhalers, insulin tools, or skin patches get explained step by step.

Picture-based medicine guides come into play when patients struggle with medical terms or speak languages other than English. Instead of relying only on words, hospital pharmacists show how treatments work by drawing or pointing - making ideas clearer through demonstration. Following along becomes easier once people explain back what they heard, a step built into these sessions deliberately. Teamwork often includes social workers who understand cultural contexts around care decisions. Standards written by the ASHP lay out how such conversations should unfold across clinics worldwide. These frameworks quietly shape expectations far beyond U.S. borders, influencing training and daily routines alike.

8. CHRONIC DISEASE MANAGEMENT

Starting off, pharmacists running clinics help people manage long-term health issues like high blood pressure, diabetes, trouble with cholesterol, breathing problems, seizures, or needing blood thinners. When it comes to handling high blood pressure, studies where patients were randomly assigned show better results when pharmacists are involved - blood pressure drops more than when only doctors take charge. Most large reviews point to a drop between 7 and 10 points in the top number of a reading, thanks to their role.

When it comes to managing diabetes, clinical pharmacists help start and adjust insulin doses, teach how to count carbs, guide patients on checking their own blood sugar, while also spotting trends in low glucose episodes. One key study at an advanced hospital in India showed that when pharmacists took charge of medicine plans, patient HbA1c dropped noticeably - going from 9.2% down to 7.6% within half a year - much more than those without such support.

Managing blood thinners is something pharmacists handle well. Their care leads to better results compared to standard medical practices. In clinics run by pharmacists, patients stay within target levels 65 to 75 percent of the time. That number often falls short when doctors manage it alone. As newer drugs like DOACs become more common, guidance shifts focus. Choosing the right one depends on individual needs, not a fixed rule. Kidney function plays a role in deciding how much to give. Patients hear clear advice: skipping pills risks serious problems. Even without regular tests, staying consistent matters most. Mistakes happen less when someone explains each step slowly. Confidence grows when questions get answered fully. Fewer errors show up in records over months. Support does not stop after the first visit. Follow-ups catch concerns early. Understanding improves when explanations fit the person listening. Long-term safety links closely to ongoing support. [18].

9. CLINICAL PHARMACY IN THE INTENSIVE CARE UNIT

Though critical care demands precision, mistakes happen often when sick patients receive many powerful drugs at once. A pharmacist on site checks every prescription closely each day, especially those tied to blood pressure support or deep sedation. Instead of waiting for problems, these specialists join team discussions during rounds. Their presence helps catch risks before harm occurs – especially around feeding tubes or clot prevention plans. With so many IV drips running at once, small miscalculations can lead to big consequences. Because timing and dose matter intensely here, trained eyes review everything, from stomach protection to sleep-inducing medicines.

One step at a time, changes add up – in a combined medical and surgical intensive care unit, having pharmacists join daily rounds linked to 78% fewer avoidable medication harms when measured against units where they did not take part. [19] Dosing adjusted by pharmacists using precise calculations for kidney-processed antibiotics, along with fine-tuning beta-lactams given steadily over hours, now shows up regularly inside strong ICU pharmacy efforts, quietly helping hit the exact levels needed to wipe out stubborn bacteria.

One way to improve ICU care? Pharmacists stepping in helps fine-tune sedation and pain control. When they lead daily breaks from sedatives, patients come off ventilators faster. Pausing meds regularly cuts down on heavy tranquilizer use. Less reliance on benzos means fewer cases of confusion during hospital stays. Their role also includes guiding teams through better pain tracking methods. These small shifts add up – shorter breathing

machine time follows. Clearer thinking in critical illness becomes more common too.

10. ONCOLOGY PHARMACY PRACTICE

Most cancer drugs need exact handling. A slip in dose can be deadly. Because of this, trained pharmacy staff now check every step. Their role helps catch mistakes before they happen. Rules require these checks as part of safe care. Expertise in medicines is non-negotiable here

Starting with safety checks, oncology clinical pharmacists make sure chemo orders follow approved guidelines while cross-checking dose math based on patient size. Moving through the details, they scan for clashes between medications or food that might interfere, then ensure pre-treatment steps are set - like nausea prevention, immune support, and fluid balance - are correctly planned. Often behind the scenes, they walk patients through what to expect when treatments start, explaining how each drug could affect them. Shifting focus to daily life, they share ways to stick to pill schedules, talk about keeping future family options open, and offer clear tips for handling side effects safely outside the clinic.

Now more than ever, a pharmacist's job in cancer care has grown because of new treatments that work differently from old ones. Instead of just killing fast-growing cells, some drugs now tweak the body's defenses - this brings fresh risks like lung inflammation or gut issues. Spotting these problems early takes know-how only certain medication experts have. When treatment stirs up the immune system too much, someone familiar with those reactions must step in quickly. Unusual side effects demand sharp eyes and deep knowledge of how these therapies behave inside patients.

11. CONTRIBUTIONS TO EDUCATION AND CLINICAL RESEARCH

Not just limited to treating patients, clinical pharmacists play a big part in teaching at hospital-based schools. Out here, teaching rounds spark deeper understanding when guided by seasoned practitioners. Real patient scenarios make tough treatment plans easier to follow. Usually, these gatherings attract medical students alongside those training in pharmacy and nursing, all engaging in real-time discussions guided by experienced professionals. Often, guidance focuses on PharmD candidates, helping them grow more comfortable with patient care decisions. Experience builds quietly during field rotations where support comes steady and close.Updates circulate steadily thanks to pharmacy teams – timely alerts about new research findings, withdrawn medications, or risks detected after release keep everyone aligned. Staff across roles stay current because structured education remains embedded in daily operations.

Out here, clinical pharmacists aren't just dispensing – they're stepping up to run studies on how drugs are actually used. Some trials come straight from their own ideas, tracking who takes what and why it matters. Instead of waiting around, they dig into population-level data, spotting trends in prescriptions across large groups. What they see in clinic – the missed doses, the confusion at pickup – shapes deeper questions about treatment success. Even small changes in a routine check-up can spark an investigation into better care models. From these efforts, clearer pictures emerge about what works in real settings. Findings like these feed directly into big-picture decisions about medicine rules nationwide. Guidelines shift because someone noticed a pattern others overlooked. Real people, real routines – that is where useful answers begin

12. CHALLENGES AND BARRIERS TO PRACTICE

Even with strong proof showing how useful clinical pharmacy services can be, deep-rooted system flaws still block wide adoption across clinics and hospitals. Staff gaps slow things down, while too few pharmacists per patient make consistent care hard to maintain. Hospital leaders often fail to see what these specialists actually do, leaving their contributions overlooked. In some regions, laws have not caught up - no clear rules exist spelling out exactly what clinical pharmacists are allowed to perform.[2]

Even small budgets make things harder in poorer countries. Without online medicine guides, digital prescription tools, or equal say for nurses and pharmacists, hospital teams often push aside pharmacy support. Proof from actual practice often drives change once it pushes clinics, governments, and international bodies to act.

Across much of North America, Europe, and Australia, established routes exist for clinical pharmacists pursuing further education. Certification opportunities are accessible through structured systems. Specialized training pathways allow professionals to build advanced skills over time. Elsewhere, such systems are still just beginning. Better structures must come first if patient care through pharmacy is to improve where it lags behind

13. FUTURE DIRECTIONS

Out here, new tech tools are changing how far a pharmacist's reach can go. When clinical decision software rides inside digital medical files, warnings pop up the moment trouble shows – like medicines clashing, allergies flaring, or doses needing tweaks.

This happens fast, live, right when it matters. With those alerts running automatically, pharmacists save time. That saved space lets them dive into tougher patient cases where human thinking makes the difference

Right now, some top hospitals have pharmacists helping doctors use gene tests to choose medicines. These experts explain DNA results so treatments can be more personal. Instead of guessing, they match drugs to a person's genetics. This kind of care is growing fast in big medical schools. One thing is clear - pharmacists need new skills to understand genes. Their role keeps shifting as science moves ahead. [9]

Out in distant towns, help with medicines can now travel through screens and signals instead of roads. Where clinics struggle to reach, virtual care steps in – offering checks on drug routines, reminders to stay on track, and follow-ups for long-term conditions. Rules that let pharmacists work this way are still being shaped across different nations. Distance fades when digital paths open up new ways to connect patients and professionals.

14. CONCLUSION:

Out in distant towns, help with medicines can now travel through screens and signals instead of roads. Where clinics struggle to reach, virtual care steps in – offering checks on drug routines, reminders to stay on track, and follow-ups for long-term conditions. Rules that let pharmacists work this way are still being shaped across different nations. Distance fades when digital paths open up new ways to connect patients and professionals.

Outcomes get better when clinical pharmacists step in – fewer avoidable problems arise, money saved often dwarfs what it costs to employ them. With health care growing more tangled everywhere, older groups needing more support, plus rising worries about drug-resistant infections and long-term illnesses, leaving pharmacists out of hospital teams makes little sense. Slotting them into care units isn't a luxury – it's something overdue.

One step forward means schools, clinics, medical groups, and lawmakers must move together. Moving ahead depends on growing training that fits real-world settings. Clarity around what clinical pharmacists can do protects their role in care teams. Progress also needs proof built from actual community experiences, not distant theories. When systems support these changes, pharmacists naturally become voices for patients. Expertise in medications grows stronger when backed by smart design. Innovation shows up quietly, through daily decisions shaped by knowledge. The modern health landscape already expects this level of engagement – no fanfare required.

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REFERENCES:

1.Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. Am J Hosp Pharm. 1990;47(3):533–543.
2.World Health Organization. The Role of the Pharmacist in the Health Care System. Geneva: WHO; 1994. Available from: https://apps.who.int/iris/handle/10665/59373
3.World Health Organization. Medication Without Harm – WHO Global Patient Safety Challenge. Geneva: WHO; 2017.
4.Pharmacy Council of India. Pharm.D. Regulations 2008. New Delhi: PCI; 2008. Available from: http://www.pci.nic.in
5.Cipolle RJ, Strand LM, Morley PC. Pharmaceutical Care Practice: The Patient-Centered Approach to Medication Management. 3rd ed. New York: McGraw-Hill; 2012.
6.International Pharmaceutical Federation (FIP). Clinical Pharmacy: Towards the Contribution in Health. The Hague: FIP; 2018.
7.Strand LM, Morley PC, Cipolle RJ, Ramsey R, Lamsam GD. Drug-related problems: their structure and function. DICP. 1990;24(11):1093–1097.
8.Cornish PL, Knowles SR, Marchesano R, et al. Unintended medication discrepancies at the time of hospital admission. Arch Intern Med. 2005;165(4):424–429.
9.Evans WE, McLeod HL. Pharmacogenomics — drug disposition, drug targets, and side effects. N Engl J Med. 2003;348(6):538–549.
10.National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP). Taxonomy of Medication Errors. Rockville, MD: NCC MERP; 2001.
11.Khalil H, Huang C. Adverse drug reactions in primary care: a scoping review. BMC Health Serv Res. 2020;20:5.
12.Lazarou J, Pomeranz BH, Corey PN. Incidence of adverse drug reactions in hospitalized patients: a meta-analysis of prospective studies. JAMA. 1998;279(15):1200–1205.
13.Central Drugs Standard Control Organisation (CDSCO). Pharmacovigilance Programme of India

(PvPI). New Delhi: Ministry of Health and Family Welfare; 2010.
14.Barlam TF, Cosgrove SE, Abbo LM, et al. Implementing an antibiotic stewardship program: guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America. Clin Infect Dis. 2016;62(10):e51–e77.
15.Davey P, Marwick CA, Scott CL, et al. Interventions to improve antibiotic prescribing practices for hospital inpatients. Cochrane Database Syst Rev. 2017;2:CD003543.
16.American Society of Health-System Pharmacists (ASHP). ASHP guidelines on pharmacist-conducted patient education and counseling. Am J Health Syst Pharm. 1997;54(4):431–434.
17.Santschi V, Chiolero A, Paradis G, Colosimo AL, Burnand B. Pharmacist interventions to improve cardiovascular disease risk factors in diabetes. Diabetes Care. 2012;35(12):2706–2717.
18.Chiquette E, Amato MG, Bussey HI. Comparison of an anticoagulation clinic with usual medical care. Arch Intern Med. 1998;158(15):1641–1647.
19.Leape LL, Cullen DJ, Clapp MD, et al. Pharmacist participation on physician rounds and adverse drug events in the intensive care unit. JAMA. 1999;282(3):267–270.
20.Carrington C, Stone L, Tiley C, et al. The Clinical Oncological Society of Australia (COSA) guidelines for the safe prescribing, dispensing and administration of systemic cancer therapy. Asia Pac J Clin Oncol. 2010;6(3):220–237.