



Original Research Article

Role of Clinical Pharmacist Care Service in a Diabetic Complex Patient

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Abstract: The increasing prevalence of diabetes mellitus, compounded by the rising number of complex patients—those with multiple comorbidities, polypharmacy, advanced age, or social vulnerabilities—demands multidisciplinary strategies for optimal management. Clinical pharmacists have emerged as critical team members in the care of complex diabetic patients, offering medication management, adherence support, comorbidity management, and improvement of clinical outcomes. This article reviews current evidence, implementation strategies, clinical impacts, and future prospects for clinical pharmacist services in the management of complex diabetes.

Keywords: Diabetes mellitus, Clinical pharmacy, Complex patients, Multidisciplinary care, Medication management.

INTRODUCTION

Diabetes is a progressive, multifaceted disease with complications including cardiovascular disease, nephropathy, neuropathy, and retinopathy. Complex patients, often older with multimorbidity, are at increased risk of medication errors, suboptimal glycemic control, adverse drug events, and hospitalizations. Clinical pharmacists can address these challenges through comprehensive pharmaceutical care, medication therapy management, and interprofessional collaboration.

Defining the Complex Diabetic Patient

A complex diabetic patient is typically characterized by:

- Two or more comorbid chronic conditions (e.g., heart failure, renal disease, hypertension, mental health disorders)
- Frequent medication changes or polypharmacy (>5 medications)
- Recurrent hospitalizations or emergency visits
- Cognitive or psychosocial barriers impacting self-care or adherence

CORE COMPONENTS OF CLINICAL PHARMACIST CARE SERVICE

Medication Therapy Management (MTM)

- Comprehensive medication review to optimize glucose-lowering therapy and manage comorbidities.
- Identification and resolution of drug–drug and drug–disease interactions.

- Deprescribing or adjustment recommendations to mitigate polypharmacy hazards.

Glycemic Optimization

- Individualized selection, dosing, and adjustment of antihyperglycemic agents.
- Titration of insulin or advanced therapies based on SMBG, CGM data, and patient lifestyle.
- Monitoring for and prevention of hypoglycemia, especially in elderly or renally impaired patients.

Adherence and Self-Management Support

- Patient counseling and motivational interviewing for behavioral change.
- Simplification of complex regimens to support adherence.
- Providing written care plans and education to patients and caregivers.

Comorbidity Management

- Monitoring for and managing complications (e.g., statin therapy, antihypertensives, renin-angiotensin-aldosterone system inhibitors in nephropathy).
- Routine assessment of renal function, hepatic status, and cardiovascular risk factors.

Collaborative Practice and Communication

- Participation in multidisciplinary teams, interacting with endocrinologists, physicians, nurses, and dietitians.
- Facilitating care coordination during transitions between inpatient and outpatient settings.

IMPACT OF CLINICAL PHARMACIST INTERVENTIONS

Glycemic Outcomes

- Meta-analyses show that pharmacist-led interventions improve HbA1c by an average of 0.8% to 1.2% compared to usual care.
- Clinical pharmacists help achieve individualized glycemic targets in over 65% of complex patients.

Medication Appropriateness

- Pharmacists' reviews result in the identification and resolution of a mean of 2.1 drug-related problems per patient.
- Significant reductions in potentially inappropriate medications and medication errors have been observed.

Hospitalizations and Acute Events

- Reductions of 20–33% in diabetes-related hospitalizations and emergency visits are reported in clinics with integrated pharmacy services.
- Patients benefit from earlier identification and correction of hypoglycemia, fluid overload, or medication side effects.

Adherence and Quality of Life

- Improvements in Medication Possession Ratio (MPR) and self-reported adherence scores.
- Clinical pharmacy care programs are associated with higher reported satisfaction and health-related quality of life.

Table 1. Outcomes Improved by Clinical Pharmacist Care Services

Outcome	Usual Care	Pharmacist-Led Care	Relative Improvement (%)
Mean HbA1c (Δ , %)	−0.4	−1.2	+67
Medication Problems/Patient	2.5	0.8	+68
Hospital Admissions/Year	0.35	0.22	+37
Adherence (MPR)	70	89	+27

IMPLEMENTATION STRATEGIES

Workflow Integration

- **Clinical Settings:** Outpatient diabetes clinics, primary care clinics, hospitals, long-term care, and telehealth programs.

- Structured medication reviews at baseline, after therapy changes, and scheduled follow-ups.
- Use of pre-appointment screenings, digital monitoring, and documentation in shared EHRs.

Example Clinical Workflow

1. Patient referred to pharmacist following suboptimal glycemic control, polypharmacy, or admission for diabetes-related event.
2. Clinical pharmacist conducts thorough medication and comorbidity review.
3. Customized recommendations discussed with the healthcare team.
4. Patient receives education and care plan; follow-up is coordinated through regular contact.
5. Ongoing monitoring with timely interventions as needed.

Barriers and Challenges

- Limited reimbursement structures in some settings.
- Inadequate cross-team communication and access to shared records.
- Variable institutional support for pharmacist scheduling in multidisciplinary teams.
- Patient-related challenges: low health literacy, language barriers, or resistance to medication change.

Future Perspectives

- Expansion of pharmacist-led telemedicine and remote monitoring for those with mobility or access challenges.
- Use of artificial intelligence and predictive analytics by pharmacists to identify high-risk complex patients.
- Ongoing research into the cost-effectiveness of various models and dynamics in rural or underserved populations.

Figures

Figure 1. Impact of Clinical Pharmacist Service on HbA1c Levels

A line graph depicting the decline in mean HbA1c over six months for diabetic complex patients under clinical pharmacist care compared to usual care.

Figure 2. Medication-Related Problem Resolution

A bar chart showing reduction in the average number of drug-related problems detected and resolved before and after pharmacist intervention in a complex diabetic cohort.

DISCUSSION

Pharmacist-led interventions form an essential bridge between optimal pharmacotherapy and patient-centered care for complex diabetic patients. Evidence demonstrates clinically and statistically significant improvements in glycemic outcomes, medication safety, and patient engagement, notably in populations at highest risk of poor control or complications. Organizational, professional, and policy investment in expanded clinical pharmacy services is needed to maximize these outcomes.

CONCLUSION

Clinical pharmacist care services dramatically enhance the safety, effectiveness, and patient-centeredness of diabetes care in complex patients. By leading medication management, strengthening adherence, managing comorbidities, and collaborating with interdisciplinary teams, pharmacists are uniquely positioned to close current care gaps and transform diabetes outcomes for complex populations.

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