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Drug Utilization Review in Maharashtra Region

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Abstract: *The irrational use of fixed-dose drug combinations (FDCs) is a growing concern in India's healthcare landscape. This study aimed to evaluate the utilization pattern of PAN-D, a commonly prescribed FDC comprising Pantoprazole (a proton pump inhibitor) and Domperidone (a prokinetic agent), in various healthcare settings across Maharashtra. Despite its therapeutic efficacy in managing gastroesophageal reflux disease (GERD), dyspepsia, and other upper gastrointestinal disorders, PAN-D is often prescribed without proper clinical justification, leading to potential misuse and suboptimal therapeutic outcomes. A cross-sectional observational study was conducted to assess prescription patterns, indications, completeness of documentation, and adherence to rational drug use guidelines. The findings revealed a significant gap in prescribing practices, with many prescriptions lacking critical information such as diagnosis, duration of therapy, and follow-up plans. The overuse of PAN-D, especially in cases without documented gastrointestinal indications, raises concerns about long-term adverse effects such as nutrient malabsorption, QT prolongation, and antimicrobial resistance. The study emphasizes the importance of reinforcing rational drug use through professional training, prescription audits, and the implementation of standardized prescription formats. Systemic interventions like electronic prescribing and continuous medical education (CME) can ensure safer and more effective use of PAN-D and other FDCs. Promoting collaborative efforts among healthcare professionals, policymakers, and patients is essential to improving prescription quality, minimizing adverse drug reactions, and optimizing healthcare resource allocation. These efforts will set a benchmark for the appropriate use of FDCs not only in Maharashtra but across India.*

Keywords: PAN-D, Pantoprazole, Domperidone, fixed-dose combination, rational drug use, prescription audit, Maharashtra, gastrointestinal disorders, prescription evaluation, healthcare policy

I. INTRODUCTION

Drug Utilization Review (DUR) is an essential component of clinical pharmacy practice and public health research, aiming to evaluate the appropriateness, safety, and effectiveness of drug use. In recent years, the irrational and excessive use of fixed-dose combinations (FDCs) has emerged as a critical concern in India, prompting a need for ongoing surveillance and policy reform. Among such combinations, PAN-D, a widely prescribed FDC of Pantoprazole (a proton pump inhibitor) and Domperidone (a dopamine antagonist and prokinetic agent), has become a common therapeutic agent for managing gastrointestinal disorders. However, there is growing concern over its over-prescription, irrational use, and lack of adherence to clinical guidelines.

Maharashtra, one of the most populous and medically advanced states in India, presents a diverse healthcare landscape ranging from state-of-the-art tertiary care hospitals to rural primary health centers. The pattern of PAN-D usage across these settings offers a representative snapshot of prescribing behaviors at both urban and rural levels. Hence, a detailed DUR focused on PAN-D in Maharashtra can offer vital insights into existing therapeutic trends, highlight deviations from rational drug use principles, and inform future healthcare policies.

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Overview of PAN-D Composition and Therapeutic Uses

PAN-D comprises Pantoprazole (40 mg) and Domperidone (30 mg) in a sustained-release capsule formulation. Pantoprazole is a proton pump inhibitor (PPI) that reduces gastric acid secretion by irreversibly blocking the H+/K+ ATPase pump in gastric parietal cells. It is widely used for the treatment of gastroesophageal reflux disease (GERD), peptic ulcer disease (PUD), erosive esophagitis, and Zollinger-Ellison syndrome. Domperidone, on the other hand, is a dopamine D2 receptor antagonist that facilitates gastric emptying and acts as an antiemetic by blocking dopamine receptors in the chemoreceptor trigger zone and the gastrointestinal tract.

In India, the Central Drugs Standard Control Organization (CDSCO) and State Drug Control Authorities regulate the use of pharmaceutical products. In recent years, the government has taken significant steps to curb the irrational use of FDCs. In 2016, the Ministry of Health banned several irrational FDCs following expert committee recommendations. PAN-D was not banned, but its use has been scrutinized in clinical discussions and DUR reports.

In Maharashtra, various medical colleges, government hospitals, and private institutions have their own drug formulary and standard treatment protocols. Despite this, prescription auditing and DUR are often poorly implemented due to limited resources, lack of trained personnel, and minimal regulatory enforcement at the grassroots level. Consequently, drugs like PAN-D continue to be prescribed indiscriminately

DEMOGRAPHIC PROFILE ANALYSIS[15-20]:

Understanding the demographic profile of patients receiving PAN-D (Pantoprazole + Domperidone) prescriptions is essential for evaluating drug utilization patterns. Demographic factors such as age, gender, socioeconomic status, geographic location, and comorbid conditions influence prescribing trends and patient responses. This section explores the demographic characteristics of patients prescribed PAN-D across various healthcare settings in Maharashtra and discusses the implications of these factors on the rational use of the drug.

Age Distribution

Age is a critical factor affecting drug prescription and metabolism. Gastrointestinal disorders like gastroesophageal reflux disease (GERD), gastritis, and dyspepsia, which are common indications for PAN-D, have varying prevalence across age groups. Generally, older adults (>60 years) are at higher risk due to physiological changes such as decreased gastric motility and increased acid secretion. Studies show that a significant proportion of PAN-D prescriptions are for middle-aged and elderly patients, reflecting the prevalence of acid- related disorders in these populations.

Children and adolescents typically receive PAN-D less frequently due to the cautious approach towards prokinetics and PPIs in pediatric populations. However, when prescribed, pediatric dosing must be carefully adjusted. In Maharashtra, urban healthcare centers report a higher prescription rate for middle-aged adults (30-60 years), while rural settings show more variability based on healthcare accessibility.

Gender Distribution

Gender disparities in drug prescriptions have been widely studied. For PAN-D, several studies indicate a slight predominance of prescriptions in males, attributed to lifestyle factors such as smoking, alcohol consumption, and dietary habits, which increase gastrointestinal symptoms. Nonetheless, females, especially postmenopausal women, also present with acid- related disorders requiring PAN-D therapy.

In Maharashtra, prescribing trends mirror this global pattern, with slightly higher male patients receiving PAN-D. However, healthcare surveys indicate increasing diagnoses among females, necessitating gender-sensitive prescribing practices and awareness of hormonal influences on gastrointestinal physiology.

Socioeconomic Status and Education

Socioeconomic status (SES) impacts healthcare-seeking behavior and medication adherence. Patients from higher SES often access private healthcare facilities where PAN-D prescriptions are more frequent, sometimes leading to overprescription due to patient demand or physician preference. Conversely, lower SES populations relying on government hospitals may have limited access or irregular supply of PAN-D.

Education level affects understanding of drug use and compliance. Studies from Maharashtra reveal that educated patients tend to adhere better to prescribed therapy and report adverse effects, enhancing safe PAN-D use. Illiterate or

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poorly educated patients may misuse or discontinue medication prematurely, highlighting the need for counseling and patient education programs.

Geographical Variation

Maharashtra's diverse geography—from urban Mumbai to rural hinterlands—affects drug utilization. Urban centers have a higher density of healthcare providers and pharmacies, facilitating easier access to PAN-D. Rural areas may face challenges such as fewer prescribers, limited diagnostic facilities, and unregulated over-the-counter sales, leading to empirical or irrational PAN-D use.

Research data indicate that urban hospitals prescribe PAN-D predominantly for documented gastrointestinal diagnoses, whereas rural clinics sometimes use it as symptomatic relief without confirmed diagnosis, reflecting the disparity in healthcare infrastructure.

Comorbid Conditions

Comorbidities influence PAN-D prescription. Patients with diabetes, hypertension, and obesity often experience increased gastrointestinal symptoms, resulting in higher PAN-D use. The elderly with multiple comorbidities are prone to polypharmacy, increasing the risk of drug interactions and adverse events with PAN-D.

In Maharashtra, studies reveal a significant number of PAN-D prescriptions among patients with chronic diseases. This necessitates careful review to avoid unnecessary or prolonged use and ensure monitoring for adverse effects.

Prescribing Setting

The healthcare setting impacts demographic trends. Government hospitals serve a broad demographic but may have limited drug supply, influencing PAN-D prescription patterns. Private clinics often see patients from diverse SES backgrounds but may have higher prescription rates due to pharmaceutical promotion and patient expectations.

Primary care centers, tertiary hospitals, and specialist clinics in Maharashtra show varying demographics, emphasizing the need for setting-specific guidelines to optimize PAN-D use.

INDICATIONS FOR PAN-D PRESCRIPTION[20-25]:

Introduction

PAN-D, a fixed-dose combination of Pantoprazole (a proton pump inhibitor) and Domperidone (a prokinetic agent), is widely prescribed for various upper gastrointestinal (GI) disorders. The combined action helps reduce gastric acid secretion and improves gastrointestinal motility, addressing symptoms such as acid reflux, nausea, vomiting, and delayed gastric emptying. This section elaborates on the clinical indications for PAN-D prescription in Maharashtra, the underlying pathophysiology of these conditions, and the appropriateness of its use based on evidence-based guidelines.

Common Clinical Indications

Gastroesophageal Reflux Disease (GERD): GERD is a chronic condition where stomach acid refluxes into the esophagus, causing heartburn, regurgitation, and discomfort. Pantoprazole suppresses acid production, while Domperidone improves esophageal clearance and gastric emptying. GERD is among the most common indications for PAN-D prescription in Maharashtra, especially in urban settings with lifestyle-related risk factors such as smoking, alcohol consumption, and high-fat diets.

Dyspepsia: Functional or non-ulcer dyspepsia, characterized by epigastric discomfort, bloating, and nausea, is another frequent reason for PAN-D use. Pantoprazole alleviates acid-related symptoms, and Domperidone aids motility, reducing gastric stasis and associated discomfort.

Gastritis and Peptic Ulcer Disease: Gastritis, the inflammation of the stomach lining, and peptic ulcers often result from Helicobacter pylori infection or NSAID use. Acid suppression via Pantoprazole promotes healing, while Domperidone helps reduce nausea. PAN-D is often prescribed as adjunct therapy in these cases.

Nausea and Vomiting: Domperidone's antiemetic properties make PAN-D useful in treating nausea and vomiting due to various causes, including gastroparesis, medication side effects, or systemic illnesses.

Delayed Gastric Emptying (Gastroparesis): In conditions where gastric motility is impaired, such as diabetes mellitus or post-surgical states, Domperidone accelerates gastric emptying, and Pantoprazole reduces acid irritation, improving patient symptoms.

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Empirical Use and Symptomatic Relief

In many healthcare settings across Maharashtra, PAN-D is also prescribed empirically for nonspecific upper GI symptoms without definitive diagnosis. This practice is prevalent due to limited access to diagnostic tools like endoscopy, especially in rural areas. While symptomatic relief is important, empirical use should be carefully balanced with rational prescribing to avoid unnecessary exposure and resistance.

Evidence-Based Guidelines and PAN-D Indications

International guidelines such as those from the American College of Gastroenterology (ACG) and Indian consensus on GERD and dyspepsia recommend proton pump inhibitors as first-line therapy for acid-related diseases. Prokinetic like Domperidone are suggested as adjuncts primarily in motility disorders or when nausea is a significant symptom.

The combination PAN-D is indicated when both acid suppression and prokinetic effects are clinically justified. However, routine use without clear indications may contribute to adverse effects and increased healthcare costs.

Prescription Trends in Maharashtra

Studies and prescription audits from Maharashtra reveal that GERD and dyspepsia constitute over 60% of PAN-D prescriptions. Other indications like gastritis, peptic ulcer, and nausea account for the remainder. Private practitioners tend to prescribe PAN-D more liberally for nonspecific symptoms compared to tertiary care centers, where diagnoses are usually evidence-based.

Off-Label and Irrational Uses

Despite clear indications, PAN-D is sometimes prescribed off-label for symptoms not primarily related to acid secretion or motility, such as general abdominal pain or as prophylaxis without gastrointestinal pathology. Such irrational use raises concerns about drug safety, adverse events, and antimicrobial resistance due to co-prescription of antibiotics.

Patient Factors Influencing Indications

Comorbidities like diabetes, obesity, and stress are common in Maharashtra and increase susceptibility to acid-related disorders. Lifestyle factors, including dietary habits and tobacco use, also influence indications for PAN-D. Tailoring prescriptions to patient-specific clinical profiles is crucial for effective therapy.

Contraindications and Cautions

PAN-D is contraindicated in patients with known hypersensitivity to either drug, significant cardiac arrhythmias, or prolactin-dependent tumors (due to Domperidone). Awareness of these factors is vital to prevent adverse effects.

RATIONALITY ASSESSMENT[26-30]:

Introduction

Rational drug use implies that patients receive medications appropriate to their clinical needs, in doses that meet their individual requirements, for an adequate period, and at the lowest cost to them and the community. The combination PAN-D (Pantoprazole + Domperidone) has gained popularity for treating upper gastrointestinal conditions due to its dual action: acid suppression and enhanced gastric motility. However, concerns about the rationality of its prescription have emerged globally, and Maharashtra is no exception. This section critically assesses the rationality of PAN-D prescriptions in Maharashtra, considering guidelines, prescribing patterns, and potential risks of irrational use.

Parameters for Rationality Assessment

Appropriateness of Indications- Rational prescription demands that PAN-D be prescribed only for evidence-based indications such as GERD, dyspepsia with delayed gastric emptying, gastritis, and nausea related to gastric motility disorders. A key rationality parameter is verifying if the indication matches clinical guidelines. Irrational prescribing includes using PAN-D for nonspecific abdominal pain, prophylaxis without documented risk, or in conditions where acid suppression or prokinetic are unnecessary.

Dose, Frequency, and Duration- Pantoprazole is typically prescribed in doses ranging from 20 mg to 40 mg once daily, while Domperidone is recommended at 10 mg three times daily, not exceeding 30 mg/day, with therapy durations generally limited to 4 weeks unless under specialist supervision. Prolonged or high-dose use can increase adverse effects risk. Rational use evaluates adherence to these dosing schedules and duration limits. Prolonged usage beyond 8 weeks without reassessment is often irrational.

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Use of Fixed Dose Combination (FDC)- While PAN-D FDC offers convenience, its use must be justified by concurrent indications for both components. Prescribing the combination when only acid suppression or only prokinetic action is needed is irrational and may expose patients to unnecessary drugs, increasing costs and side effects.

Assessment of Drug Interactions and Contraindications- Rational prescribing requires careful review of patient comorbidities and concurrent medications. Domperidone can prolong QT interval, posing risks in patients with cardiac disorders or those on QT- prolonging drugs. Pantoprazole may alter the absorption of drugs like clopidogrel. Ignoring these interactions signifies irrational use.

Prescribing Based on Diagnosis and Evidence- Rational PAN-D use is supported by diagnostic confirmation (endoscopy, imaging, or clinical criteria). Empirical use without proper diagnosis may lead to over prescription and mask underlying conditions. Documentation of diagnosis in prescriptions enhances rationality.

Current Scenario in Maharashtra

Several prescription audits and drug utilization reviews from Maharashtra indicate mixed rationality in PAN-D prescribing:

Over prescription and Empirical Use: Many prescriptions lack documented indications or diagnostic confirmation, especially in primary care and rural setups. PAN-D is often prescribed for vague symptoms such as generalized abdominal discomfort, without evidence-based justification.

Inappropriate Duration: Prolonged use of PAN-D beyond recommended duration without follow-up or reassessment has been observed, raising concerns about potential side effects like hypomagnesemia, gastric infections, or extrapyramidal symptoms from Domperidone.

Noncompliance with Guidelines: Deviations from recommended dosing frequency and strength are common, including under dosing or overdosing, possibly due to prescriber habits or patient non-adherence.

Use of FDC without Necessity: Some practitioners prescribe the combination even when monotherapy (Pantoprazole alone) would suffice, indicating irrational fixed-dose combination use.

Polypharmacy Risks: In elderly or comorbid patients, PAN-D is frequently prescribed alongside other gastro protective agents, antibiotics, and cardiovascular drugs, without proper drug interaction checks, risking adverse events.

Consequences of Irrational PAN-D Use

Adverse Drug Reactions (ADRs): Irrational PAN-D use increases the likelihood of ADRs such as headache, diarrhea, QT prolongation, extrapyramidal symptoms, and drug- induced liver injury.

Economic Burden: Unnecessary prescriptions add to patient costs, particularly when branded combinations are used instead of generic drugs.

Antimicrobial Resistance: PAN-D is often co-prescribed with antibiotics irrationally, contributing indirectly to antimicrobial resistance.

Masking Serious Pathologies: Empirical treatment without diagnosis may delay identification of severe GI diseases such as malignancy or peptic ulcer complications.

Strategies to Improve Rationality

Adherence to clinical guidelines issued by national bodies like the Indian Council of Medical Research (ICMR) and international gastroenterology associations.

Continuing medical education(CME) and awareness programs for prescribers emphasizing rational PAN-D use.

Implementation of prescription audits and drug utilization reviews at healthcare facilities.

Patient counseling to ensure adherence and reporting of adverse effects.

Regulatory oversight on fixed-dose combinations to prevent irrational promotion.

Drug Utilization Review (DUR) is an essential strategy used to ensure that medications are prescribed and used rationally, effectively, and safely. It involves a comprehensive evaluation of prescribing patterns, patient compliance, and treatment outcomes to ensure optimal use of pharmaceuticals. At the state level, such as in Maharashtra, this process becomes vital due to the large and diverse population that relies heavily on government and private healthcare systems. Pharmacy and Therapeutics (P&T) Committees play a critical role in DUR, particularly in hospitals and government health institutions. These committees evaluate new and existing medications for inclusion in formularies,

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considering cost- effectiveness, safety, efficacy, and local disease burden. They help to standardize treatment guidelines and minimize irrational drug use. The relevance of DUR and P&T committees in Maharashtra has increased, especially after policy shifts toward rational prescribing, increased awareness about antibiotic resistance, and the necessity to manage healthcare costs. The integration of DUR and P&T operations can potentially enhance therapeutic outcomes, reduce adverse drug reactions, and ensure that public health funds are used efficiently. This rationality assessment explores the structural efficiency, practical implementation, challenges, and policy implications of DUR and P&T committees in the context of Maharashtra's healthcare system.

In Maharashtra, several government hospitals and tertiary care centers have initiated basic forms of Drug Utilization Reviews and have established P&T Committees. Institutions like JJ Hospital, KEM Hospital, and other state-run medical colleges play a pivotal role in such initiatives. These committees often comprise clinical pharmacologists, pharmacists, physicians, and administrators who assess drug data and provide therapeutic guidance. One of the strengths is the growing awareness among healthcare professionals regarding rational drug use and antimicrobial stewardship. Maharashtra has also made progress in digitalizing prescriptions under government schemes like the Health Management Information System (HMIS), which allows easier DUR implementation. However, significant weaknesses persist. Many district and rural hospitals lack trained personnel or standardized systems for DUR. P&T committees often exist only in name, without proper meeting schedules or documentation. The lack of financial incentives, training programs, and integration of real- time prescribing data weakens the impact of these reviews. Moreover, decisions often remain unimplemented due to bureaucratic delays or resistance from prescribers. Therefore, while the framework for DUR and P&T exists at certain levels in Maharashtra, their rational application remains inconsistent and often ineffective due to poor institutional commitment and infrastructural challenges.

Rational drug use is critical to public health, especially in a state like Maharashtra, where healthcare delivery must balance quality and affordability. An effective Drug Utilization Review can help identify over prescription, misuse of antibiotics, polypharmacy in elderly patients, and irrational fixed-dose combinations. These issues are highly prevalent in urban and rural healthcare setups across Maharashtra. DUR supports the evaluation of prescribing indicators such as average number of drugs per prescription, percentage of antibiotics prescribed, and the proportion of drugs prescribed by generic name. These metrics are pivotal in assessing adherence to WHO and national prescribing norms. Moreover, P&T Committees can utilize these insights to revise hospital formularies and develop local Standard Treatment Guidelines (STGs). In Maharashtra, where diseases like tuberculosis, diabetes, and hypertension are on the rise, consistent monitoring of drug use can greatly improve therapeutic outcomes. The rationality of DUR and P&T processes can be measured through reduced adverse drug reactions, better patient compliance, cost reduction, and lower incidence of antimicrobial resistance. Despite their proven benefits, the lack of uniform application and policy enforcement limits the effectiveness of these programs. This makes rationality assessments crucial to identify gaps and propose evidence-based improvements.

Despite a well-intentioned framework, Maharashtra faces several challenges in the rational implementation of DUR and P&T committee activities. The foremost is the disparity between urban and rural healthcare facilities in terms of infrastructure, staffing, and technological support. Most DUR processes require electronic health records or prescription monitoring software, which are absent in many district hospitals. Even when records exist, there's often a lack of trained pharmacists or pharmacologists to interpret the data. P&T Committees, where they exist, often lack autonomy or are overridden by administrative or political interests. There is also limited collaboration with academic institutions, which could otherwise support pharmacovigilance and evidence-based decision-making. At the policy level, the absence of state-mandated guidelines for DUR practices results in inconsistent reporting and monitoring. The Maharashtra FDA focuses more on drug manufacturing and sale rather than rational drug use in clinical settings. Additionally, pharmaceutical marketing practices can bias prescribing behavior, further undermining DUR efforts. Funding limitations, staff shortages, and insufficient training make it difficult to conduct regular committee meetings or perform meaningful evaluations. These gaps not only affect healthcare delivery but also lead to higher economic burdens on both the state and the patient population due to irrational drug usage and avoidable complications.

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DOCUMENTATION AND PRESCRIPTION COMPLETENESS[35-40]:

Introduction

Accurate and complete documentation in prescriptions is a cornerstone of rational drug use, patient safety, and effective healthcare delivery. Prescription completeness refers to the inclusion of all necessary details such as patient information, drug name, dosage, route, frequency, duration, and prescriber signature. Incomplete prescriptions can lead to medication errors, poor therapeutic outcomes, and adverse drug events. This section examines the completeness of PAN-D prescriptions in Maharashtra healthcare settings, identifies common gaps, and discusses the implications of documentation practices on patient care

Essential Components of a Complete Prescription

A legally and clinically valid prescription must contain:

Patient Details: Full name, age, sex, and contact information. This helps avoid medication errors, especially in populations where drug dosing depends on age or weight.

Date of Prescription: To track therapy duration and validity.

Drug Name: Generic or brand name of the drug with clarity to avoid ambiguity.

Dosage and Strength: Amount of each component (e.g., Pantoprazole 40 mg + Domperidone 10 mg).

Route of Administration: Oral, intravenous, etc.

Frequency and Timing: How often and when the drug should be taken.

Duration of Therapy: Number of days or weeks.

Indication: The medical reason for prescribing PAN-D.

Prescriber Details: Name, designation, signature, and registration number.

Special Instructions: Food considerations, adverse effect warnings, or dose adjustments if any.

Current Status of Prescription Completeness in Maharashtra

Studies and audits analyzing PAN-D prescriptions in Maharashtra reveal variable documentation quality:

- **Patient Demographics Often Missing or Incomplete:** Age and sex are sometimes omitted, leading to potential dosing errors especially in vulnerable groups such as pediatrics and geriatrics.
- **Dates and Duration Not Always Recorded:** Many prescriptions lack clear therapy duration or date, complicating follow-up and increasing risks of prolonged or unmonitored drug use.
- **Inadequate Detailing of Dosage and Frequency:** Ambiguity in dosage strength or frequency is frequent, especially when generic names are not used, or brand names with multiple strengths exist.
- **Indications Rarely Documented:** One of the critical omissions is the lack of stated indication for PAN-D, making it difficult to assess rationality or justify therapy retrospectively.

Prescriber Identification Incomplete: Some prescriptions lack full prescriber credentials, affecting accountability and legal validity.

Impact of Incomplete Documentation

Medication Errors: Missing or ambiguous information can result in dispensing the wrong dose, incorrect frequency, or unnecessary continuation of therapy.

Adverse Drug Events: Without clear instructions or duration, patients may self-modify therapy leading to toxicity or sub therapeutic effects.

Poor Monitoring and Follow-Up: Lack of date and duration details hampers clinicians' ability to review and discontinue therapy appropriately.

Legal and Ethical Issues: Incomplete prescriptions violate medical ethics and legal standards, exposing practitioners to liability.

Reduced Data Quality for Research: Poor documentation limits the reliability of prescription audits and drug utilization reviews essential for healthcare improvement.

Reasons for Incomplete Prescriptions

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Time Constraints and Workload: High patient volume in government and private clinics limits the time available for detailed documentation.

Lack of Awareness: Some prescribers may underestimate the importance of complete prescriptions.

Systemic Gaps: Absence of standardized prescription formats or electronic medical records in many healthcare centers.

Patient Factors: Some patients request hurried consultations or do not demand detailed prescriptions.

Strategies to Improve Documentation

Standardized Prescription Formats: Adoption of pre-printed or electronic templates mandating essential fields can enhance completeness.

Training and Sensitization: Workshops and continuing medical education for healthcare providers on prescription writing norms.

Use of Electronic Prescribing Systems: Digital tools can reduce omissions and provide alerts for incomplete entries.

Regular Audits and Feedback: Institutional audits with constructive feedback encourage prescribers to improve documentation.

Patient Education: Encouraging patients to ask for detailed prescriptions can indirectly improve prescriber compliance.

Examples from Maharashtra

Several tertiary care hospitals in Maharashtra have implemented prescription audits and electronic health records with notable improvements in prescription completeness, demonstrating the effectiveness of these interventions.

RECOMMENDATIONS FOR PRACTICE IMPROVEMENT[41-45]:

Introduction

Optimizing the prescribing practices of PAN-D (Pantoprazole + Domperidone) is crucial to enhance therapeutic outcomes, minimize adverse effects, reduce healthcare costs, and promote rational drug use. Based on the findings of prescribing patterns, rationality assessment, and documentation practices in Maharashtra, this section outlines evidence-based recommendations aimed at improving clinical use and patient safety related to PAN-D.

Adherence to Clinical Guidelines

Implementation of Standard Treatment Protocols: Healthcare institutions should adopt and enforce national and international clinical guidelines for the management of upper gastrointestinal disorders that clearly define the appropriate indications, dosing, and duration for PAN-D use.

Regular Updates and Dissemination: Ensure that prescribers are kept informed about updated guidelines through continuous medical education (CME) sessions, workshops, and online resources.

Prescriber Education and Training

Focused Training Programs: Conduct targeted educational interventions highlighting the pharmacology of PAN-D, indications, contraindications, drug interactions, and adverse effect profiles.

Promote Rational Fixed Dose Combination (FDC) Use: Educate prescribers about the rational use of PAN-D FDCs only when both components are clinically indicated, avoiding unnecessary polypharmacy.

Encourage Generic Prescribing: Training should encourage the use of generic drug names to improve clarity, reduce costs, and prevent dispensing errors.

Prescription Audit and Feedback

Regular Drug Utilization Reviews (DUR): Hospitals and clinics should implement periodic audits of PAN-D prescriptions to monitor rationality, completeness, and adherence to protocols.

Constructive Feedback Mechanisms: Share audit findings with prescribers to identify gaps and encourage corrective measures.

Incentivize Best Practices: Recognize and reward departments or practitioners demonstrating exemplary rational prescribing patterns.

Enhanced Documentation Practices

Standardized Prescription Formats: Introduce structured prescription templates mandating inclusion of all essential fields—patient details, indication, dosage, frequency, duration, and prescriber information.

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Electronic Prescribing Systems: Encourage adoption of e-prescribing tools that enforce mandatory fields and reduce errors.

Patient Information Leaflets: Provide patients with clear written instructions and information on PAN-D therapy to improve adherence and awareness of potential side effects.

Patient-Centric Approaches

Patient Counseling: Pharmacists and healthcare providers should counsel patients on the importance of adhering to prescribed dosage and duration, potential side effects, and when to seek medical advice.

Encourage Patient Participation: Empower patients to ask questions about their prescriptions and report any adverse effects promptly.

Monitoring and Pharmacovigilance

Adverse Drug Reaction (ADR) Reporting: Establish robust systems to monitor and report ADRs related to PAN-D, particularly cardiac effects linked to Domperidone.

Regular Follow-Up: Encourage follow-up consultations to reassess the need for ongoing therapy and adjust treatment accordingly.

Policy and Regulatory Measures

Restrict Over-the-Counter (OTC) Availability: PAN-D should be dispensed strictly on prescription to prevent self-medication and misuse.

Regulate Fixed Dose Combinations: Authorities should evaluate and regulate the manufacturing and marketing of PAN-D FDCs to ensure they meet therapeutic justification.

Implement Prescription Monitoring Programs: Use centralized databases to track prescribing trends and identify patterns of irrational use.

II. CONCLUSION

This study highlights the irrational prescribing practices surrounding PAN-D in Maharashtra and underscores the urgent need for rationalization in drug use. While PAN-D remains a valuable therapeutic option for upper GI disorders, its misuse without proper indication and documentation can compromise patient safety and treatment efficacy. Systemic interventions such as standardized prescriptions, electronic prescribing systems, regular audits, and prescriber education are critical for ensuring the rational use of FDCs. Collaborative engagement among healthcare professionals, administrators, and patients is essential to foster evidence-based practices and promote optimal use of PAN-D

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