a) Hospital and Its Organization

Puzzle Questions

1. A hospital has 200 beds and is classified as a secondary hospital. It aims to upgrade to a tertiary hospital by adding a cardiology unit and an ICU. If the hospital must maintain a patient-to-specialist ratio of 10:1 for 500 patients and currently has 15 specialists, how many additional specialists are needed, and what changes in the organizational structure would support this transition?
2. In a hospital, the organizational structure includes a CEO, medical director, and department heads for surgery, pediatrics, and nursing. If a new radiology department is introduced, requiring a department head and three technicians, design a new hierarchical structure and determine how many additional staff are needed if the hospital's staff-to-bed ratio must remain at 2:1 for 300 beds.
3. A primary hospital refers 20% of its 100 monthly patients to a secondary hospital due to a lack of surgical facilities. If the primary hospital adds a surgical unit requiring two surgeons and four nurses, calculate the reduction in referrals and propose how the medical staff's functions should be reorganized to accommodate this change.

Case Study Questions

Case Study: Expansion of a Rural Primary Hospital A small primary hospital in a rural area with 50 beds is facing increased patient load due to population growth. The hospital, government-owned, provides basic services like general medicine and maternity care. The administration is considering upgrading to a secondary hospital by adding specialized departments like pediatrics and radiology. The organizational structure includes a CEO, medical director, nursing head, and basic support staff, but lacks a dedicated board of directors. Medical staff includes general physicians and nurses, with limited specialists on call.

1. Based on the classification of hospitals, evaluate the feasibility of upgrading from primary to secondary level and identify the key clinical and non-clinical changes required.
2. Propose a revised organizational structure, including the roles and functions of key medical staff, to support the expansion.
3. Analyze potential challenges in integrating new medical staff and how their functions would align with the hospital's goals.

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b) Hospital Pharmacy and Its Organization

Puzzle Questions

1. A hospital pharmacy dispenses 1,000 prescriptions daily, with a layout allowing only 50% efficiency due to poor design. If the pharmacy employs one chief pharmacist and two assistants, calculate how many additional staff are needed to achieve 100% efficiency, assuming each staff member handles 200 prescriptions per day, and propose a new layout to optimize workflow.
2. In a hospital pharmacy, the staff includes one pharmacist and three technicians handling compounding, dispensing, and inventory. If the pharmacy must process 500 IV admixtures daily, requiring 10 minutes each, and each staff member works 8 hours, determine if the current staff is sufficient or how many additional technicians are needed to avoid overtime.
3. A hospital pharmacy is located far from the ICU, causing a 15-minute delay in delivering critical medications. If the pharmacy serves 300 patients daily and 10% require urgent delivery, design a new location and layout to reduce delivery time by 50%, and calculate the impact on patient care efficiency.

Case Study Questions

Case Study: Inpatient Medication Error in a Tertiary Hospital In a 600-bed tertiary hospital, the pharmacy department is centrally located near the inpatient wards but has a linear layout causing delays in drug dispensing. The structure includes a chief pharmacist, two assistants, and technicians, with functions focused on procurement, compounding, and patient counseling. A recent incident involved a mislabeled antibiotic leading to an allergic reaction in an ICU patient. The hospital pharmacist's responsibilities include monitoring drug interactions but lack integration with electronic health records. Staff shortages have led to overtime, impacting layout efficiency.

1. Assess the hospital pharmacy's organizational structure and recommend improvements in location, layout, and staff requirements to prevent future errors.
2. Outline the responsibilities of the hospital pharmacist in this scenario, including their role in patient safety and functions like drug utilization review.
3. Develop a plan to enhance the pharmacy's functions, such as integrating technology for better workflow and staff training.

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c) Adverse Drug Reaction

Puzzle Questions

1. A patient experiences dizziness due to a drug interaction between two medications, with one causing a 20% increase in the other's plasma concentration. If the hospital identifies 50 such cases monthly through spontaneous reporting but misses 30% of cases due to lack of record linkage, calculate the total estimated ADRs and propose a method to improve detection accuracy.
2. A hospital records 100 adverse drug reactions annually, with 40% classified as allergic reactions and 30% as excessive pharmacological effects. If the hospital implements a new

monitoring system that increases detection by 25%, determine the new annual ADR count and categorize the additional cases by type.

3. A patient on three drugs experiences an idiosyncratic reaction, with a probability of 0.01% for each drug. Calculate the combined probability of an ADR occurring and suggest how spontaneous case reports and record linkage studies could confirm the reaction's cause.

Case Study Questions

Case Study: Polypharmacy in an Elderly Patient An 75-year-old patient with hypertension, diabetes, and arthritis is admitted to a hospital after experiencing dizziness and falls. The patient's medications include enalapril (for hypertension), metformin (for diabetes), and ibuprofen (for arthritis). Upon review, the hospital pharmacist identifies a potential adverse drug reaction: excessive pharmacological effects from ibuprofen exacerbating hypertension, combined with a pharmacokinetic interaction where ibuprofen reduces metformin's efficacy. The patient has a history of mild idiosyncrasy to NSAIDs. No prior ADR reporting was done, and the hospital uses spontaneous case reports but lacks record linkage studies.

1. Classify the adverse drug reactions in this case (e.g., excessive effects, drug interactions) and explain the mechanisms involved, including beneficial vs. adverse interactions.
2. Recommend methods for detecting and managing these ADRs, such as spontaneous reporting or record linkage, and outline the reporting process to regulatory authorities.
3. Propose a management plan, including dose adjustments, monitoring, and patient education to prevent recurrence.

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d) Community Pharmacy

Puzzle Questions

1. A retail drug store dispenses 200 prescriptions daily, with 25% being proprietary products requiring specific records. If the store employs two pharmacists working 6 hours each and each prescription takes 5 minutes to process, calculate if additional staff are needed and propose a record-keeping system to comply with legal requirements.
2. A wholesale drug store supplies 1,000 units of medication weekly to 10 clinics but fails to maintain temperature logs, violating legal standards. If 20% of the medications are temperature-sensitive and require 2 hours of daily monitoring, calculate the staff hours needed and design a storage layout to ensure compliance.
3. A community pharmacy has a retail section and a small wholesale unit but lacks separate storage for controlled substances, leading to a 10% error rate in inventory. Propose a new design to reduce errors by 50% and calculate the impact on inventory accuracy for 5,000 monthly transactions.

Case Study Questions

Case Study: Compliance Issues in a Retail Drug Store A community retail drug store in an urban area, owned by a licensed pharmacist, stocks both prescription and over-the-counter drugs, including proprietary products like branded pain relievers. The store's structure includes a dispensing counter, storage area, and small wholesale section for bulk orders to nearby clinics. Recently, during an inspection, authorities found incomplete records for Schedule H drugs, improper dispensing of a proprietary antibiotic without prescription, and non-compliance with legal requirements for storage temperature. The design lacks separate areas for controlled substances, leading to inventory errors.

1. Evaluate the organizational structure and design of the retail/wholesale drug store, and suggest improvements to meet legal requirements for establishment and maintenance.
2. Analyze the dispensing process for proprietary products in this case and identify violations, including record-keeping for retail and wholesale operations.
3. Develop a compliance plan, including staff training on legal requirements, record maintenance (e.g., purchase/sale registers), and redesign suggestions for better organization.