PH-Vol I (1)2019

Pharma-Lagom

Just right medication

Theme

"Safe and Effective Medication Use for All"

Pharmacy Department
Kalaniketan Polytechnic College, Jabalpur M.P

Letter from the Principal

Dear Students/faculty,

August - September always my favourite times of the year when new academic session starts, new students come and our senior class transitioning onto the jobs. Amidst this time, it also allows us time to reflect on our growth, challenges and successes that we have experienced over the course of the Pharmacy Department. Within the past few years, Pharmacy Deptt., recognized as one of the best to my knowledge. This recognition is a testament to the dedication of the faculty, staff of Pharmacy Deptt. This also led to recognition of entire KN Polytechnic College family.

This month, Pharmacy Deptt., celebrated two occasions, one is Deptt's first News Magazine ***"Pharma-Lagom"*** and the other is the "Pharmacist Day" on 25th September, 2019. The faculties' contributions of knowledge towards pharmacy field and continuing their education standard at colleges is appreciable. It is exciting to see Pharmacy students of KN Polytechnic College continue to live out our mission as our recent pass outs have been placed successfully and few of them transferred to B. Pharm. graduates colleges. Congratulations to all members of the class of 2019. We wish you, the best in next steps in your journey.

As we live out our mission of K.N. Polytechnic College, conclusively, I feel immense gratitude to have the opportunity to work alongside a dedicated community of families, students and staff. Wherever you may be in your post-Pharmacy Course journey, I encourage you to stay connected with our growing community of alumni.

I wish you the best this academic session.

R.C. Pandey
Principal
Kalaniketan Polytechnic College, Jabalpur

Letter from the Head Pharmacy

Dear Pharmacy Students/faculty and Scholars,

As you are aware, that Pharmacy Deptt., is celebrating this month started first of its kind a News Letter and a Magazine ***"Pharma-Lagom"*** means - just right efforts toward pharmacy education. In this Magazine, we have compiled various articles/papers from our PhD Scholars, students and faculties to have a readable and understanding language. I feel, everyone would love to read this Magazine and appreciate our efforts.

The other positive action done by our Deptt is, we have celebrated the **"Pharmacist Day"** on 25th September, 2019. The theme of the day is celebrated to organize activities that promote and advocate the importance of pharmacists to aware people in the safe and effective use of medicines, getting rid of the counterfeit medicines in every corner of the world.

"Pharmacist Day" is all about honouring our pharmacist friends, all those men and women, who are an integral part of the medical care. The day is about saying them "Thank You," the words that they don't get to hear too often. Let's take the day as the perfect occasion for thanking them for being in the front lines of pharmacy, and having lots of patience and compassion for being committed and dealing with sympathy to patients, reading the doctors handwriting and smiling always, in spite of working that extra hour.

The faculties' knowledge contributions towards pharmacy field and continuing their education standard at Pharmacy Deptt is appreciable. I am thankful to Mr BK Jain, Ms Kaminee Sahu and Ms Ankita Singh, who have been imparting students, the updated knowledge of Pharmaceutical sciences. This was apart from their PhD work.

Pharmacy students of KN Polytechnic College continue to live up and give best results so to fulfil our mission and our recent pass outs have secured jobs at good place. I therefore congratulate each faculty/research scholars and students for their sincere efforts.

The content of the scripts of the Magazine ***"Pharma-Lagom"*** has been so designed that it includes major components of pharmacy articles contributed by students, faculties and research scholars.

You all will appreciate that there are around 100 publications have been made by the faculties of Pharmacy Deptt. Around 15 papers have been published during current year 2019. I therefore thanks to faculties B.K. Jain, Kaminee Sahu and Ms Ankita Singh for such tremendous efforts. We successfully achieved Pharmacy Deptt missions and objectives for which I am thankful to faculties/staff and students who made these occasion successful.

I wish you all the best,

Dr Seema Kohli
Head of Deptt.-Pharmacy
Kalaniketan Polytechnic College, Jabalpur

Preface

I welcome to the first issue of ***"Pharma Lagom"*** Magazine.

Those of you who have seen the first issue of ***"Pharma Lagom"*** Magazine. We also state on the same page that it's not written in stone.

I am pleased to present the latest ***"Pharma Lagom"*** Magazine issue no 1 of the Pharmacy Deptt of the K.N. Polytechnic College, Jabalpur. In the current issue, we publish the results of the latest research from the fields of pharmaceutical and health Sciences.

You are aware that Pharmacy Deptt., has celebrated various occasions, one is News Letter ***"Pharma Impetus", other is*** Deptt's first News Magazine ***"Pharma-Lagom"*** and the last one is the ***"Pharmacist Day"*** on 25th September, 2019. The faculties' contributions of knowledge from Head, Dr Seema Kohli, Ms Kaminee Sahu and Ms Ankita Singh, towards pharmacy field education standard to students is appreciable. I put forward congratulations to all students of 2019.

You know that, we complied our mission of K.N. Polytechnic College, and therefore I am thankful to a dedicated students and staff and faculty.

Happy viewing,

Dr B. K. Jain

Editor & lecturer

Inside:

Faculty contribution

1. Pharmacovigilance Role in Promoting Safe and Effective Medicines for all. Dr. Seema Kohli, (Head) Pharmacy department.
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3. Safe and effective use of medication in Geriatrics. Ms. Ankita A. Singh, Guest faculty, Pharmacy department.
4. Safe and effective use of medication in Pediatric. Ms. Kaminee Sahu, Guest faculty, Pharmacy department.

Student's contribution

1. Adverse Drug Reaction. Namrata Anthony, D.Pharm I year.
2. Side Effects of Vitamins. AkanshaKachhi, RinkalRajpal, MahimaLodhi, D.Pharm II year.
3. First-Aid: Role of Pharmacist in emergency. Kartikey Mehra, D.Pharm I year.
4. Radio Therapy-A Hope for Cancer Patient. Pallavi Yadav and Prachi Tripathi, D Pharm II- Year.
5. Correct administration of drug in eye. Smriti Shukla, D.Pharm II year.
6. Safe administration of medicines into eyes. Jayanti Devi, D.Pharm II year.

FACULTY CONTRIBUTION

Pharmacovigilance Role in Promoting Safe and Effective Medicines for all

Dr. Seema Kohli, Head-Pharmacy Deptt.

Pharmacovigilance

Pharmacovigilance (PV) is defined as the science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other drug-related problem. WHO established its Programme for International Drug Monitoring in response to the thalidomide disaster detected in 1961. Together with the WHO Collaborating Centre for International Drug Monitoring, Uppsala, WHO promotes PV at the country level. At the end of 2010, 134 countries were part of the WHO PV Programme. The aims of PV are to enhance patient care and patient safety in relation to the use of medicines; and to support public health programmes by providing reliable, balanced information for the effective assessment of the risk-benefit profile of medicines.

The evolution of pharmacovigilance in recent years and its growing importance as a science critical to effective clinical practice and public health science. Pharmacovigilance is now firmly based on sound scientific principles and is integral to effective clinical practice. The discipline needs to develop further to meet public expectations and the demands of modern public health.

Background

The World Health Organization has a mandate from its Member States to develop, establish, and promote international standards with respect to food, biological, pharmaceutical and similar products There is also provision made in Article 21 of the constitution of the World Health Assembly to adopt regulations concerning standards with respect to the safety, purity and potency of biological, pharmaceutical and similar products moving in international commerce.

Safety Concern

Within the last decade, there has been a growing awareness that the scope of pharmacovigilance should be extended beyond the strict confines of detecting new signals of safety concerns. Globalization, consumerism, the explosion in free trade and communication across borders, and increasing use of the Internet have resulted in a change in access to all medicinal products and information on them. These changes have given rise to new kinds of safety concerns such as:

- Illegal sale of medicines and drugs of abuse over the Internet
- Increasing self-medication practices

- Irrational and potentially unsafe drug donation practices
- Widespread manufacture and sale of counterfeit and substandard medicines
- Increasing use of traditional medicines outside the confines of the traditional culture of use
- Increasing use of traditional medicines and herbal medicines with other medicine with potential for adverse interactions. There is a need for a reconsideration of pharmacovigilance practice in the light of the lack of clear definition of boundaries between:
- Food and medicines (including traditional/herbal medicines and 'natural products'),
- Medical devices, and cosmetics.

The purpose of pharmacovigilance

Pharmacovigilance is the science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other possible drug-related problems. Recently, its concerns have been widened to include:

- Herbals
- Traditional and complementary medicines
- Blood products
- Biologicals
- Medical devices
- Vaccines.

Many other issues are also of relevance to the science:

- Substandard medicines
- Medication errors
- Lack of efficacy reports
- Use of medicines that are not approved and for which there is inadequate scientific basis
- Case reports of acute and chronic poisoning
- Assessment of drug-related mortality
- Abuse and misuse of medicines
- Adverse interactions of medicines with chemicals, other medicines, and food.

Why pharmacovigilance is needed

The processes involved in the clinical development of medicines, once put onto the market, a medicine leaves the secure and protected scientific environment of clinical trials and is legally set free for consumption by the general population. At this point, most medicines will only have been tested for short-term safety and efficacy on a limited number of carefully selected individuals.

The aims of pharmacovigilance

Events such as the thalidomide tragedy highlight the extreme importance of effective drug monitoring systems for all medicines. The principal aims of pharmacovigilance programmes are:

- To improve patient care and safety in relation to the use of medicines, and all medical and paramedical interventions;
- To improve public health and safety in relation to the use of medicines;
- To contribute to the assessment of benefit, harm, effectiveness and risk of medicines, encouraging their safe, rational and more effective (including cost-effective) use;
- To promote understanding, education and clinical training in pharmacovigilance and its effective communication to health professionals and the public.

Pharmacovigilance in National Drug Policy

The provision of good quality, safe and effective medicines and their appropriate use is the responsibility of national governments. The establishment of a national medicine regulatory agency and a designated center for the study of adverse reactions are central to the achievement of these functions. Multidisciplinary collaboration is of great importance; in particular, links need to be forged between various departments of the ministry of health and also with other stakeholders, such as the pharmaceutical industry, universities, nongovernmental organizations (NGOs) and those professional associations having responsibility for education on rational use of medicines and pharmacotherapy monitoring.

Pharmacovigilance in the Regulation of Medicines

Robust regulatory arrangements provide the foundation for a national ethos of medicine safety, and for public confidence in medicines. To be effective, the remit of drug regulatory authorities needs to go further than the approval of new medicines, to encompass a wider range of issues relating to the safety of medicines, namely:

- Clinical trials;
- The safety of complementary and traditional medicines, vaccines and biological medicines;
- The development of lines of communication between all parties which have an interest in medicine safety, ensuring that they are able to function efficiently and ethically, particularly at times of crisis.

Pharmacovigilance in clinical practice

Safety monitoring of medicines in common use should be an integral part of clinical practice. The degree to which clinicians are informed about the principles of pharmacovigilance, and practice according to them, has a large impact on the quality of health care. Education and training of health professionals in medicine safety, exchange of information between national pharmacovigilance

centres, the coordination of such exchange, and the linking of clinical experience of medicine safety with research and health policy, all serve to enhance effective patient care. A regular flow and exchange of information in this way means that national pharmacovigilance programmes are ideally placed to identify gaps in our understanding of medicine-induced diseases.

Pharmacovigilance in disease control public health programmes

The monitoring of medicine safety in countries where there is no regulatory or safety monitoring system in place, or in remote areas with little or no health care surveillance or infrastructure, has been identified as a matter for concern. The problems are especially apparent in situations that involve the use of medicines in specific communities, for example, for the treatment of tropical diseases such as malaria, leishmaniasis and schistosomiasis, and for the treatment of HIV/AIDS and tuberculosis. In some settings several disease control initiatives involving the administration of medicines to large communities are being implemented within the same population with little knowledge of, or regard to, how these various medicines could interact with each other. Pharmacovigilance should be a priority for every country with a public health disease control programme.

Communicating the outcome of pharmacovigilance

It is not sufficient for the experts to be satisfied with the safety evidence for a given medicine. The public perception of the hazards associated with medicines is an equally important factor. How safe is safe enough? Which risks are acceptable? These are critical questions that providers of medicines need to consider when communicating with patients and the general public. The pharmaceutical industry, governments and health-care providers have a duty to build public trust through effective communication of risk. This can only be achieved once the public mindset has been examined and fully understood.

Role of Pharmacovigilance in India: An overview

Pharmacovigilance (PV) plays a key role in the healthcare system through assessment, monitoring and discovery of interactions amongst drugs and their effects in human. Pharmaceutical and biotechnological medicines are designed to cure, prevent or treat diseases; however, there are also risks particularly adverse drug reactions (ADRs) can cause serious harm to patients. Thus, for safety medication ADRs monitoring required for each medicine throughout its life cycle, during development of drug such as pre-marketing including early stages of drug design, clinical trials, and post-marketing surveillance. PV is concerns with the detection, assessment, understanding and prevention of ADRs. Pharmacogenetics and pharmacogenomics are an indispensable part of the clinical research. Variation in the human genome is a cause of variable response to drugs and susceptibility to diseases are determined, which is important for early drug discovery to PV. Moreover, PV has traditionally involved in mining spontaneous reports submitted to national surveillance systems. The research focus is shifting toward the use of data generated from platforms outside the conventional framework such as electronic medical records, biomedical

literature, and patient-reported data in health forums. The emerging trend inPV is to link premarketing data with human safety information observed in the post-marketing phase. The PV system team obtains valuable additional information, building up the scientific data contained in the original report and making it more informative. This necessitates an utmost requirement for effective regulations of the drug approval process and conscious pre and post approval vigilance of the undesired effects, especially in India. Adverse events reported by PV system potentially benefit to the community due to their proximity to both population and public health practitioners, in terms of language and knowledge, enables easy contact with reporters by electronically. Hence, PV helps to the patients get well and to manage optimally or ideally, avoid illness is a collective responsibility of industry, drug regulators, clinicians and other healthcare professionals to enhance their contribution to public health.

Conclusion

Despite its 40-year history, pharmacovigilance remains a dynamic clinical and scientific discipline. It continues to play a crucial role in meeting the challenges posed by the ever increasing range and potency of medicines, all of which carry an inevitable and some- times unpredictable potential for harm.

When adverse effects and toxicity do appear
- Especially when previously unknown - it is essential that these are reported, analysed and their significance communicated effectively to an audience that has the knowledge to interpret the information.

For all medicines there is a trade-off between the benefits and the potential for harm. The harm can be minimized by ensuring that medicines of good quality, safety and efficacy are used rationally, and that the expectations and concerns of the patient are taken into account when therapeutic decisions are made. To achieve this is to:

- serve public health, and to foster a sense of trust among patients in the medicines they use that would extend to confidence in the health service in general;
- ensure that risks in drug use are anticipated and managed;
- provide regulators with the necessary information to amend the recommendations on the use of the medicines;
- improve communication between the health professionals and the public;
- educate health professionals to understand the effectiveness/risk of medicines that they prescribe.

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Hazards and Safety Measures of Parenteral Therapy

Dr. B.K. Jain, Lecturer Pharmacy Deptt

Introduction:

Injection safety is taken as major health care issue in developing country like India and now it is essential to educators and pharmacist to learn and have sufficient knowledge of Injection safety under health care. World Health Organisation (WHO) has also taken several steps to curb ill effects of transfusion of blood using injections.

Injection is one of the most common health care procedures. Each year at least 16 billion injections are administered in developing and transitional countries. The vast majority, around 95% are given in curative care .Immunisation accounts for around 3% of all injections, with remainders for other indications including use of injections of blood and blood products and contraceptives.

In certain regions of the world, use of injections has completely overtaken the real need, reaching proportions no longer based on rational medical practice. In some situations, as many as nine out of ten patients presenting to a primary health care provider receive an injection, over 70% of which are unnecessary or could be given in an oral therapy. Patients tend to prefer injections because they believe them to be stronger and faster medications. They also believe that doctors regard injections to be the best treatment. In turn, doctors over- prescribe injections because they believe that this best satisfies patients, even though patients are often to alternatives. In addition, prescription of an injection sometimes allows the charging of a higher fee for service. Better communication between patients and provider can clarify these types of misunderstandings and help to reduce injection overuse.

Essential Qualities of Parenteral Formulations:

- They must be sterile, free from pyrogens &particulate matter.
- They must be isotonic with biological fluids.

Aforesaid qualities are attributed during the manufacturing process. User should alsomaintain the qualities during the manufacturing process.

Disease that Unsafe Injection can Cause:

Injections are often unnecessary and are frequently unsafe. Unsafe injections are responsible for millions of cases of Hepatitis Band C, HIV/AIDS and an estimated one- quarter of a million cases of annually.Re-use of injection equipment without sterilization is frequently a key problem. A safe injection does not harm. However, when safety control practises are not respected, severe infections can result, putting human lives at risk.

Hazards during Parenteral Therapy:

Blood transfusion has become the necessity in the modern practice of medicine. Without the help of transfusion services, cancer surgeries, chemotherapies and treatment of several haematological disorders would be unthinkable. Parental therapy is in increasing demand because of the requirements and nature of injectable, they are most difficult to prepare and administer is estimated that 40% of hospitals received daily injections The consequences of errors are most severe. There is a tendency to associate the hazards of parental therapy with microbiological contamination along with other hazards and problem with parental also exist as follows:

- Infusion phlebitis indicates inflammation of the vein are due to infection, trauma, particularmatter, plastic, needle tonicity, location of I. V. site etc.
- The presence of particulate matter include cotton, glass, rubber, plastic, bacteria, fungi &other debrisetc come from any source such as environment, improper storage &packaging temp., mixing and addition of complex drugs.

Miscellaneous Hazards:

- Cracked containers-Source of microbial contaminations
- Multiple use of single dose containers-Sterility may be affected.
- Addition to plastic infusion containers.
- Deteriorated &outdated parenteral.
- Faulty &inadequate storage condition.
- Importance of proper storage recognizedby hospital and medical shop.
- Drug interaction.
- Absence and conflicting of stability data
- Preservative toxicity.
- Inadequate instruction for use.
- Administration through wrong route.
- The use of wrong diluents may cause instability, precipitation and side effects.
- Misuse, overuse and abuse of parenteral drugs.

Safety Measures to Prevent Hazards with Particulate Matters &OtherContaminant:

- Improved air-handling system by using LFBor Aseptic Room.
- Improved washing and filtrationmethods.
- Improved dispensing and compounding methods.
- Evaluation of Parental Products.
- Better understanding of the problems of the particulate matter.
- Precise and safe use of preservatives and other additives.
- Compatibility among container, closure &solution.
- Proper labeling associated with free from following medication on errors.

Safe and Appropriate Use of Injections:

Unsafe injection practices are often viewed as a chronic problem with no easy solution. However, safe and appropriate use of injections can be achieved by adopting a three part strategy:

1. Changing behavior of health care workers and patients
2. Ensuring availability of equipments and supplies
3. Managing waste safely and appropriately

Safe Injection Practices:

- Use aseptic technique to avoid contamination of sterile injection equipment.
- Do not administer medications from a syringe to multiple patients, even if the needle or cannula on the syringe is changed.
- Use fluid infusion and administration sets for one patient only and dispose appropriately after use.
- Use single-dose vials for parenteral medications whenever possible.
- Do not administer medications from single-dose vials or ampoules to multiple patients or combine leftover contents for later use.
- If multi-dose vials must be used, both the needle or cannula and syringe used to access the multi-dose vial must be sterile.
- Do not keep multi-dose vials in the immediate patient treatment area. Store in accordance with the manufacturer's recommendations and discard if sterility is compromised or questionable.
- Do not use bags or bottles of intravenous solution as a common source of supply for multiple patients.

Conclusion:

Reuse of syringe and needles in the absence of sterilization exposes millions of people to infections. Worldwide, up to 40%of injections are given with syringes and needles reused without sterilization and in some countries this proportion is as high as 70%.Other unsafe practices, such as poor collection and disposal of dirty injection equipment, exposes healthcare workers and the

community to the risk of needle stick injuries. In some countries unsafe disposal can lead to re-sale of used equipment in the black market.WHO hosts and coordinates the Safe Injection Global Network (SGIN), which assembles all major stakeholders to promote and sustain injection safety worldwide. Through the network, WHO provides advice and a series of policy, management and advocacy tool to help countries access safe, affordable equipment, promote the training of health staff and rational use of injections.

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Safe and effective use of medication in Geriatrics

Ankita Alice Singh, Guest Faculty Pharmacy Deptt

Abstract:

Prescribing for elderly patients presents distinctive challenges. Premarketing drug trials often exclude geriatric patients and approved doses may not be appropriate for older adults. A number of medications need to be used with special caution because of age-related changes in pharmacokinetics (absorption, distribution, metabolism, and excretion) and pharmacodynamics (the physiologic effects of the drug).As the numbers of elderly people are increasing in many countries, (both developed and developing), the outcome of non-adherence are likely to rise. Complex chronic conditions and multiple comorbidities are prevailing in older people, requiring the ongoing use of numerous medicines, often with complex timing and dosing regimens. Older people often have greater difficulty managing their medicines because of the reduction in cognitive function, memory, mobility and manual adroitness. Exceptional caution must be taken in determining drug doses when prescribing for older adults. An increased volume of distribution may result from the proportional increase in body fat relative to skeletal muscle with aging. Decreased drug clearance may result from the natural decline in renal function with age, even in the absence of renal disease.

Keywords: Elderly, geriatric, prescribing, medicines, disease.

Introduction:

Rational use of drug presumes significance in elderly persons as they use more prescribed and over the counter (OTC) drugs than the younger populations. A disproportionate number of elderly people suffer from chronic and degenerative pathology, leading in turn to a demand for more medication. However, knowledge about the efficacy and safety of many drugs is often scanty for the frail for the elderly because they are generally excluded from clinical trials. While being the major consumers and the greatest beneficiaries of modern drug therapy, elderly patients are particularly vulnerable and are mostly at risk of suffering adverse drug reactions (ADRs). ADR's in the elderly have been characterized as "a major modern epidemic". Appropriate history taking is a crucial step and equally challenging due to various inherent difficulties in this age group. Ensuring the participation of patient's caregivers in this process is very important with assessment of use of non-prescription medications and dietary supplements, allergy history, and experience of any adverse effects or any other problem with the medications. It is necessary to start with a low dose and titrate the medication dose slowly giving due consideration for the renal and hepatic function of the patient.

Patient Compliance/Adherence:

In many situations it has been observed that the drugs are not used by the older patient in a manner to obtain maximum benefit and safety. Though the term non-compliance ordinarily suggests fault

of the patient in inappropriate use of the medication, it has been observed that on many occasions the instructions given by the physician or the pharmacist have not been properly communicated or understood by the patient (especially geriatric). It has been found that patients on short duration therapy show a greater compliance than those with the long term therapy.

Types of non-compliance: Lack of understanding, barriers to communications, complex regimen, differing doses, inconvenient scheduling, error of dosage, adverse events, cost, social isolation, discontinuation of drug without advice. Some other important factors that add up to non-compliance in an elderly patient are disease, multiple drug therapy, frequency of administration, duration of therapy, drugs given to an asymptomatic patient. One of the common cases that have been observed in case of older patients is the overdosing, when the patient forgets to take a dose and doubles the next dose to compensate for the earlier miss.

Ramification of non-compliance:

1. Underutilization of the drug, thereby depriving the patient of the full therapeutic benefit and the possibility of a progressive worsening of their condition, recurrence of infection etc.
2. The physician unaware of underutilization may prescribe the drugs in larger doses for control of symptoms.
3. Exposure to the potential risk of abrupt discontinuation of therapy as with antihypertensive drugs, anticonvulsants etc.
4. Non-compliance, sometimes, may also result in over utilization of a drug. Excessive doses may be employed or the usual dose is administered more frequently with the aim to obtain quicker and greater relief e.g. with analgesics.

Elders: Their medicines and safety

People are more likely to develop one or more chronic illnesses with advancing age, and appropriate medication can help seniors live longer and more active lives. However, medication use in older adults is also more likely to be associated with safety concerns. Medication safety is therefore a particular concern for the elderly.

- Financial issues may prevent seniors from filling some prescriptions.
- Age-related challenges like memory loss or poor eyesight can make it harder to follow instructions for taking medication.
- Age-related changes in the liver, kidneys, central nervous system, and heart are among the contributing factors causing elderly people to be more vulnerable to overdose and side effects.
- As people age, they are much more likely to be prescribed more than one kind of prescription medication, and many seniors take three or more. This increases the risk for drug interactions, mix-ups, and the potential for side effects.
- With a growing number of prescription medicines available and a growing population of older adults, the potential for medication safety problems is expanding.

A stepwise approach in prescribing a drug to an elderly:

Presented below is one systematic approach to improving prescribing practices when managing older adults. Regardless of the sequence of steps, what is essential in prescribing is to continually reappraise the patient's medication regimen in light of his or her current clinical status, goals of care, and the potential risks/benefits of each medication.

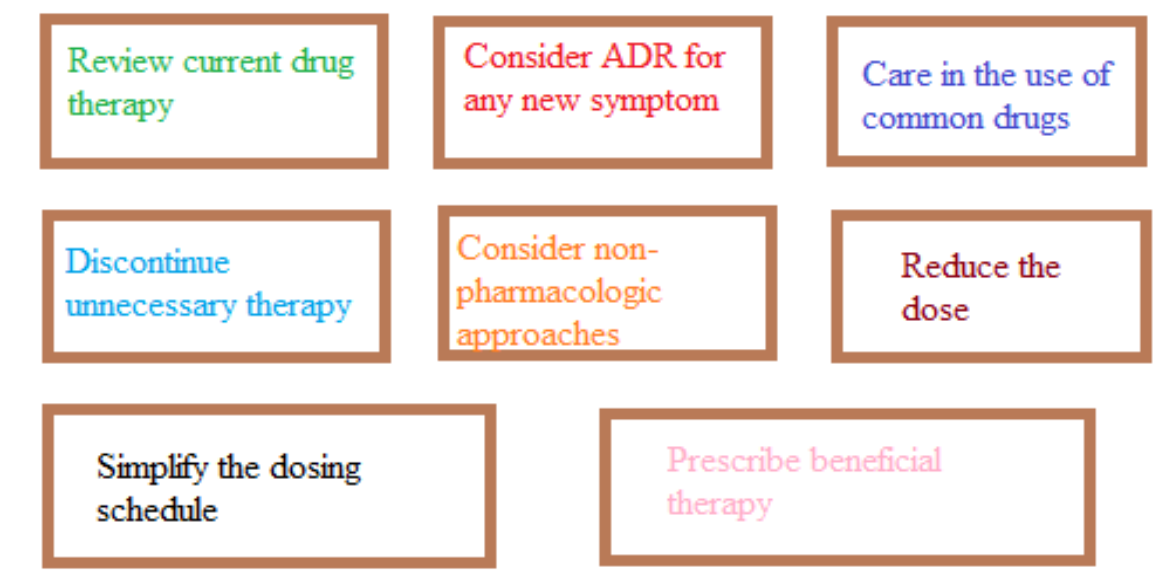

Fig: Systematic approach to improving prescribing practices.

Other effective approaches that could be adopted are as follows:

1. **Effective communication:**

- The elderly patients needs to be engaged (and care, where applicable) in the decision making process about treatments and choices in medications.
- Determining the patient's cognitive status and level of health literacy, and guiding the discussion to ensure that he or she can engage in this decision-making process.

- Establishing and sustaining links between members of the healthcare team, especially doctors, nurses and pharmacists, so that pharmacists have access to all relevant clinical information.
- Enabling pharmacy to fulfill its pivotal role to enhance understanding of the therapeutic plan and dispel any ill-founded concepts that might lead to intentional non-adherence.

2. **To make it as easy as possible for older patients to take their medicines correctly, this includes:**

Dosatte Container

- Keeping medication regimens as simple as possible from the outset.
- Reviewing medication regimens (for example, by means of home medication reviews conducted by pharmacists) to identify and manage polypharmacy.
- Dose administration aids should be provided in a such a way that it help patients (or carers) to take the right medicine in the right dose at the right time, and to keep track of what they have or have not taken.
- Empowering the family members to support the patient in complyingto his or her medication regimen.
- Reminders should be provided, for both i.e. to take the medicines and also to obtain and fill repeat prescriptions.

3. **To sustain the effort:** None of the interventions described above is self-sustaining, and adherence can only improve on an ongoing basis with continued input to the patient's need.

- Directions should be repeated whenever the opportunity arises (for example, when prescriptions are being refilled).
- Enquiring needs to be done on whether taking the medicine is causing any problems, and addressing any problems that emerge, preferably in consultation with the prescriber.
- On regular basis, it is an important aspect to observe dose administration techniques and making corrections where necessary (for example, with inhaled medicines).

Conclusion:

Most of these approaches apply to patients of all ages, particularly adults. However, as noted above, the elderly are large users of medicines, their medication regimens are often complex, and the presence of cognitive decline adds to the challenge. Mild or early cognitive decline may be unnoticed by health professionals in brief encounters. All health professionals, notably including pharmacists, should be given training and possibly other support so that they do not miss signs of cognitive decline in patients, and can take account of patient's impairment in their communications, advice and actions.

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Safe and effective use of medication in Pediatric

Kaminee Sahu, Guest Faculty Pharmacy Deptt.

Introduction

Pediatric patients, defined as those younger than 18 years. Newborn infants born before 37 weeks of gestational age are termed premature; those between 1 day and 1 month of age are neonates; 1 month to 1 year are infants; 1 to 11 years are children; and 12 to 16 years are adolescents.

Only one fourth of the drugs approved by the U.S. Food and Drug Administration (FDA) have indications specific for use in the pediatric population. Data on the pharmacokinetics, pharmacodynamics, efficacy, and safety of drugs in infants and children are scarce. Lack of this type of information led to disasters such as gray baby syndrome from chloramphenicol, phocomelia from thalidomide, and kernicterus from sulfonamide therapy. Gray baby syndrome was first reported in two neonates who died after excessive doses of chloramphenicol (100–300 mg/kg/day); the serum concentrations of chloramphenicol immediately before death were 75 and 100 mcg/mL (75 and 100 mg/L; 232 and 309 μmol/L). Patients with gray baby syndrome usually have abdominal distension, vomiting, diarrhea, a characteristic gray color, respiratory distress, hypotension, and progressive shock.

Pharmacokinetics and pharmacodynamics of pediatric medications

- Children are not just “little adults,” and lack of data on important pharmacokinetic and pharmacodynamic differences has led to several disastrous situations in pediatric care.

- Variations in absorption of medications from the gastrointestinal tract, intramuscular injection sites, and skin are important in pediatric patients, especially in premature and other newborn infants.

- The rate and extent of organ function development and the distribution, metabolism, and elimination of drugs differ not only between pediatric versus adult patients but also among pediatric age groups.
- The effectiveness and safety of drugs may vary among age groups and from one drug to another in pediatric versus adult patients.
- Concomitant diseases may influence dosage requirements to achieve a targeted effect for a specific disease in children.
- Use of weight-based dosing of medications for obese children may result in suboptimal drug therapy.
- The myth that neonates and young infants do not experience pain has led to inadequate pain management in this pediatric population.
- Special methods of drug administration are needed for infants and young children.
- Many medicines needed for pediatric patients are not available in appropriate dosage forms; thus, the dosage forms of drugs marketed for adults may require modification for use in infants and children, necessitating assurance of potency and safety of drug use.
- The pediatric medication-use process is complex and error-prone because of the multiple steps required in calculating, verifying, preparing, and administering doses.

Literature review

Great variation in the paediatric medication error rates reported due to differences in study design. Prescribing error rate 0.45 to 30.1 errors per 100 orders in the USA drug administration error rates varied from 0.6% to 27%. Dosing errors are the most common type of errors in pediatrics (particularly 10-fold or greater overdose caused by calculation errors).

Why children are at greater risk from medication errors

Drug doses are calculated based on a patient's age, weight or body surface area. Weight changes over time & recalculation of drug doses is required, particularly in neonates.

- Inadequate information.
- Inadequate availability of appropriate dosage forms and concentrations.
- Fewer internal reserves to buffer any medication errors which may occur.

Another area of concern in pediatrics is identifying an optimal dosage. Dosage regimens cannot be based simply on body weight or surface area of a pediatric patient extrapolated from adult data. Bioavailability, pharmacokinetics, pharmacodynamics, efficacy, and safety information can differ markedly between pediatric and adult patients, as well as among pediatric patients, because of differences in age, organ function, and disease state. Significant progress has been made in the area of pediatric pharmacokinetics during the past 2 decades, but few such studies have correlated pharmacokinetics with the outcomes of efficacy, adverse effects, or quality of life.

Factors to be considered in optimizing pediatric drug therapy

Because most drugs are either metabolized by the liver or eliminated by the kidney, hepatic and renal diseases are expected to decrease the dosage requirements in patients. Nevertheless, not all diseases require lower doses of drugs. For instance, patients with cystic fibrosis require larger doses of certain drugs to achieve therapeutic concentrations.

Hepatic Disease

Because the liver is the main organ for drug metabolism, drug clearance usually is decreased in patients with hepatic disease. However, most studies on the influence of hepatic disease on dosage requirements have been performed in adults, and these data may not be extrapolated uniformly to pediatric patients.

Renal Disease

Renal failure decreases the dosage requirement of drugs eliminated by the kidney. Once again, because of limited studies, dosage adjustments in pediatric patients are based largely on data obtained in adults. For many important drugs, such as aminoglycoside antibiotics, renal clearance or rate of elimination is directly proportional to the GFR, as measured by endogenous renal creatinine clearance

Cystic Fibrosis

Drug therapy in pediatric patients with cystic fibrosis has been reviewed. For unknown reasons, these patients require increased doses of certain drugs. Studies have reported higher clearance of drugs such as gentamicin, tobramycin, netilmicin, amikacin, dicloxacillin, cloxacillin, azlocillin, piperacillin, and theophylline in patients with cystic fibrosis compared with patients without the disease. The apparent volume of distribution of certain drugs also may be altered in cystic fibrosis. Severity of the illness may influence the change in dosage requirements, but this is not certain.

Obesity

One third of American children and adolescents are obese or overweight. The prevalence of pediatric obesity has nearly tripled for children 2 to 5 years of age and for those 12 to 19 years of age; it has quadrupled for children 6 to 11 years of age over the past 30 years.

Obese children are at risk for metabolic complications and the development of comorbid conditions, including high blood pressure, high cholesterol, type 2 diabetes mellitus, nonalcoholic fatty liver disease, polycystic ovary disorder, and obstructive sleep apnea

Medication errors occur at various stages

1 Prescribing

2 Transcribing

3 Dispensing

4 Administration

Dose Requirements

Medication doses often are based on the body weight of neonates, infants, and children, for example, milligrams per kilogram of body weight per day to be given in one or more portions daily. However, certain drugs, including antineoplastic agents, may be given based on body surface area, for example, milligrams per square meter in one or more doses daily. In either case, the total amount of weight- or surface area-based individual or daily dose in a pediatric patient, especially an adolescent, should not exceed the amount of drug indicated in an adult patient.

Clark's rule and Young's rule

are two of several different methods of calculating paediatric dosages.

Clark's Rule

Clark's Rule uses **Weight** in Lbs, NEVER in Kg.

Here is the formula:

Adult Dose X (Weight ÷ 150) = Childs Dose

Young's Rule

Young's Rule uses **age**.
(which makes it easier to remember, the word young refers to age)

Here is the formula:

Adult Dose X (Age ÷ (Age+12)) = Child's Dose

An additional challenge in managing paediatric drug therapy is understanding the effects of obesity on a population that relies on weight-based dosing. As mentioned earlier, the number of children who are overweight or obese has increased markedly over the past four decades. Using ideal body weight versus total body weight to calculate a weight-based dose or to determine body surface area can result in a large variance in obese patients. Additional pharmacokinetic studies are needed to study the effects of obesity on drug distribution, protein binding, and clearance and to identify whether dosing should be adjusted according to total body weight or ideal body weight to achieve consistent drug exposure for individual drugs. Generally, the highest drug dose recommended for a child is the maximum dose approved for adults. However, determining the highest dose of certain

drugs for use in children without a known maximum dose for adults (e.g., intravenous immunoglobulin, infliximab, rituximab, and liposomal **amphotericin B** [AmBisome]) can be difficult.

WHO Model: List of Essential Medicines for Children

Model List is intended to use for children up to 12 years of age.

The **core list** presents a list of minimum medicine needs for a basic health-care system, listing the most efficacious, safe and cost-effective medicines for priority conditions. Priority conditions are selected onthe basis of current and estimated future public health relevance, and potential for safe and costeffective treatment. The complementary list presents essential medicines for priority diseases, for which specialized diagnostic or monitoring facilities, and/or specialist medical care, and/or specialist training are needed.

In case of doubt medicines may also be listed as complementary on the basis of consistent higher costs or less attractive cost-effectiveness in a variety of settings.

The **square box symbol (□)** is primarily intended to indicate similar clinical performance within apharmacological class. The listed medicine should be the example of the class for which there is thebest evidence for effectiveness and safety. In some cases, this may be the first medicine that is licensed for marketing; in other instances, subsequently licensed compounds may be safer or more effective. Where there is no difference in terms of efficacy and safety data, the listed medicine should be the one that is generally available at the lowest price, based on international drug price information sources. Therapeutic equivalence is only indicated on the basis of reviews of efficacy and safety and when consistent with WHO clinical guidelines. National lists should not use a similar symbol and should bespecific in their final selection, which would depend on local availability and price.The format and numbering of the 18th WHO Model List of Essential Medicines have been retained but,as indicated in the text, some sections have been deleted because they contain medicines that are notrelevant for children.

A indicates that there is an age or weight restriction on use of the medicines; the details for each Medicine.

In the List of Essential Medicines for Children, an additional symbol is used:

R indicates that the Committee has endorsed the medicine as essential but has requested a review of the efficacy and safety to confirm this decision, or to expand use to additional age groups.

The presence of an entry on the Essential Medicines List carries no assurance as to pharmaceutical quality. It is the responsibility of the relevant national or regional drug regulatory authority to ensure that each product is of appropriate pharmaceutical quality (including stability) and that when relevant, different products are interchangeable.

References

Official website of WHO, **guidelines and publication-WHO:** https://www.who.int

STUDENT'S CONTRIBUTION

Adverse Drug Reaction

Namrata Anthony, D. Pharm I year

Adverse drug reaction or we can say ADR is unwanted or harmful reaction which is experienced after the administration of a drug or combination of medicine under normal condition of use. ADRs may occur following a single dose or prolonged administration of a drug or result from the combination of two or more drug. Adverse drug reaction embrace rashes, jaundice, Anemia, a decrease in WBCs count, Kidney damage and nerve injury. Affected person is also allergic or supersensitized to the drug owing to genetic variation in the way this body metabolizes or respond to medicine.

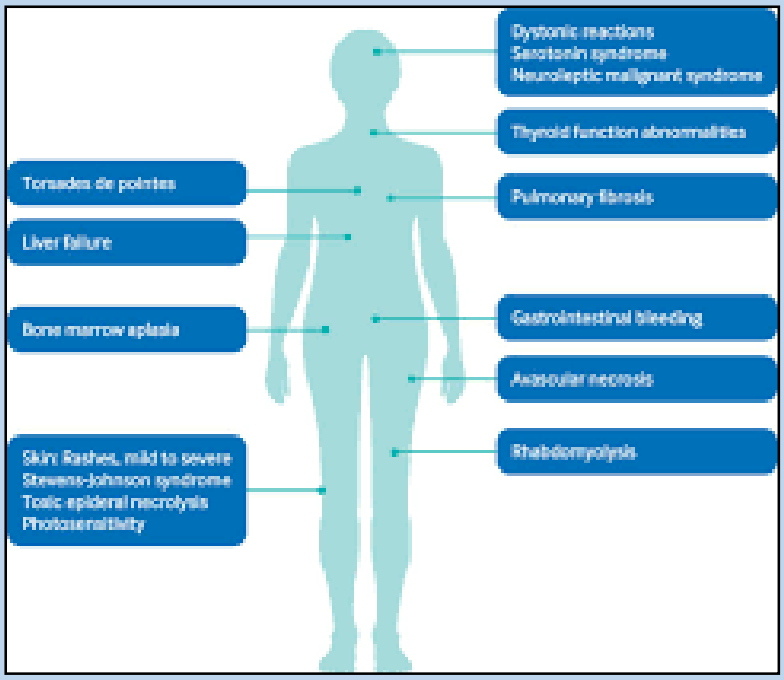
ADR are common occurrence in a hospital setting, attributed to the security and complexity of the disease process. The use of multiple drug, drug interaction and possible negligence ADR could be observed in 10-20% of hospitalized patients and may be responsible for prolonged hospital stay.

Side effect is an imprecise term often used to refer to a drug's unintended effect that occurs within the therapeutic range. Because all drugs have the potential for adverse drug reaction, risk benefit analysis is necessary whenever a drug is prescribed symptom and signs may manifest soon after the first dose or only after chronic use. They may obviously result from drug use or be too suitable subtle to identify as drug-related. In the elderly subtle ADRs can cause functional deterioration, changes in mental status, loss of appetite, confusion and depression.

Physicians should report most suspected adverse drug reaction to Medwatch the food and Drug Administrations which is an early and alert system. ADRs be identified and investigated Medwatch also monitor changes in a nature and frequency of ADRs.

Modification of dosage, Discontinuation of drug if necessary, switching to a different drug. For dose related adverse drug reactions, modifying the dose or eliminating or reducing precipitating factors may suffice increasing the rate of drug increasing the rate of drug elimination is rarely necessary. For allergic and idiosyncratic ADRs, the drug is usually should be discontinued and not cried again.

Prevention of adverse drug reaction requires familiarity with the drug and potential reaction to it, computer based analysis should be used to check for potential drug interactions analysis should be repeated whenever drugs are changed or added. Drugs are initial dosage must be carefully selected for the elderly. If patients develop non-specific symptoms, ADRs, should be always be considered before beginning symptomatic treatment.



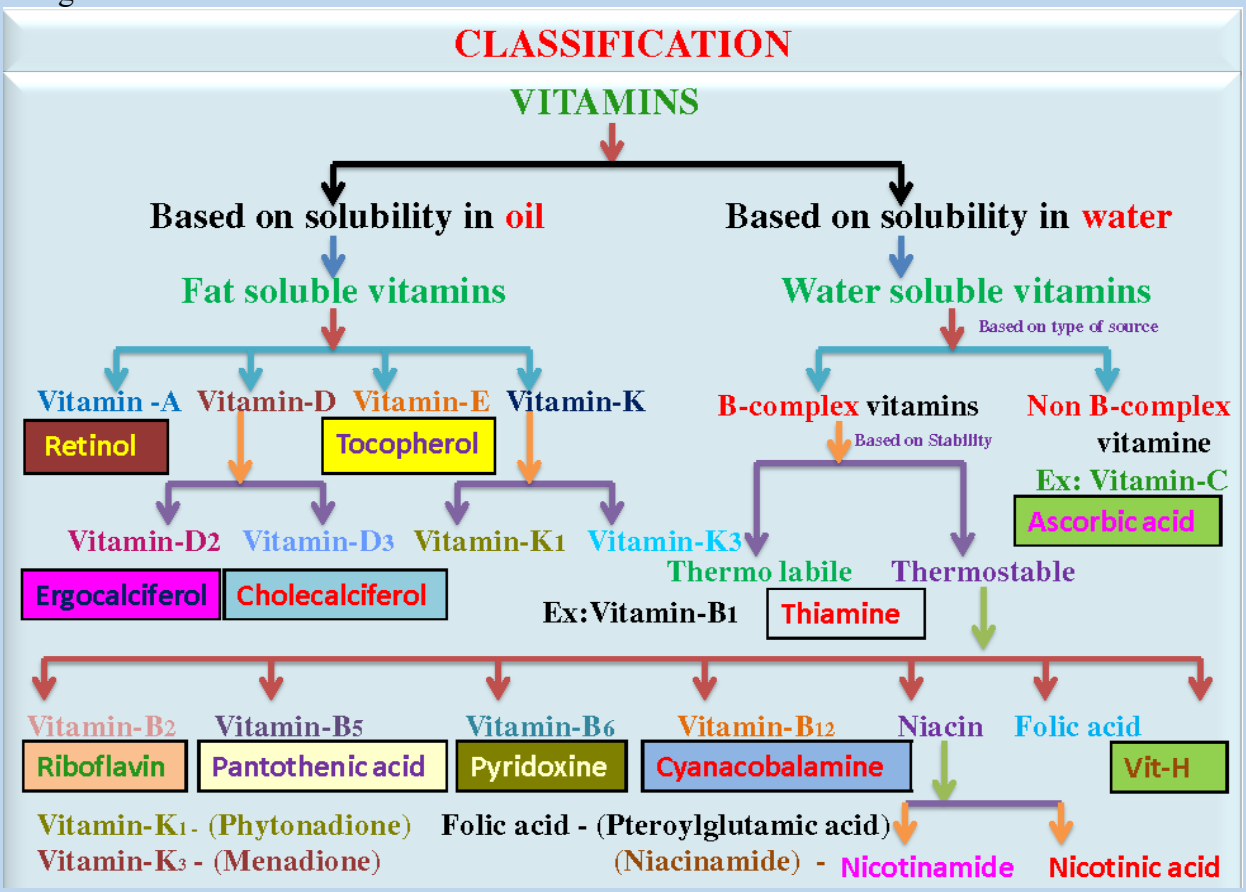
Side Effects of Vitamins

Akansha Kachhi, Rinkal Rajpal, Mahima Lodhi, D. Pharm II year

INTRODUCTION:

We conducted this systematic review to help the Agency for Healthcare Research and Quality (AHRQ) update its recommendation on the use of multivitamins for the prevention of cardiovascular disease (CVD) and cancer in the general population. The U.S. Preventive Services Task Force (USPSTF) will use this review to update its 2003 recommendations on routine vitamin supplementation to prevent chronic diseases.[1] This review addresses the benefits and harms of single, paired, and multiple vitamins and/or minerals as primary prevention for CVD and cancer in the general population without nutritional deficiencies or existing chronic diseases.

Definition of vitamin:-The word "vitamin" was coined in 1911 by the Warsaw-born biochemist Casimir Funk (1884-1967). At the Lister Institute in London, Funk isolated a substance that prevented nerve inflammation (neuritis) in chickens raised on a diet deficient in that substance. He named the substance "vitamine" because he believed it was necessary to life and it was a chemical amine. The "e" at the end was later removed when it was recognized that vitamins need not be amines.



Vitamin A (Retinol | Carotenoids): The primary sources of vitamin A:-Retinol is found in liver, egg yolk, butter, whole milk, and cheese. Carotenoids are found in orange-flesh sweet potatoes, orange-flesh fruits (i.e., melon, mangoes, and persimmons), green leafy vegetables (i.e., spinach, broccoli), carrots, pumpkins, and red palm oil.

Function of Vitamin A

- Vitamin A plays a central role in our vision, skin, genes, growth, and immune system.
- It is especially important during the early stages of pregnancy in supporting the developing embryo.
- Infections and fevers increase the requirement for vitamin A
- Three different forms of vitamin A are active in the body: retinol, retinal, and retinoic acid.
- These are known as retinoids. The cells of the body can convert retinol and retinal to the other active forms.

Side Effect of Vitamin A

- Bleeding from gums or sore mouth
- confusion or unusual excitement
- diarrhea
- dizziness or drowsiness
- double vision

- Headache (severe)

- Vomiting (severe)

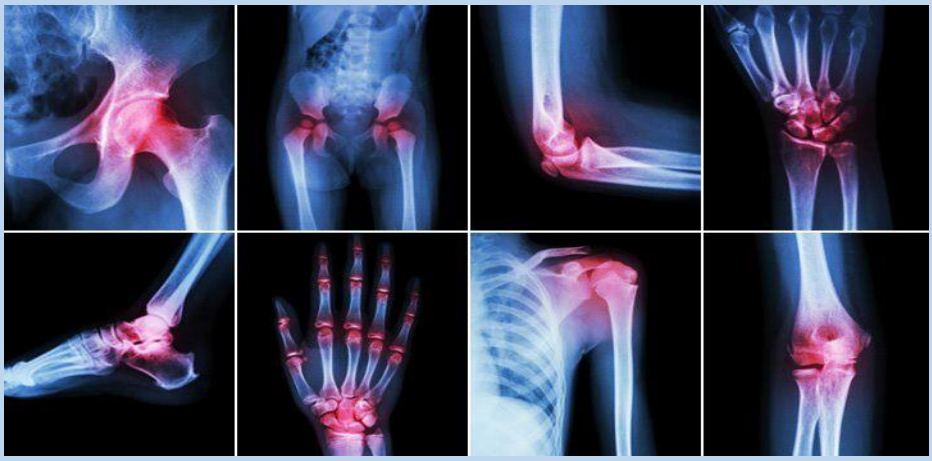
Vitamin D(Calciferol):Sources:-Sunlight – exposure to ultraviolet B (UVB) rays is necessary for the body to synthesize vitamin D from the precursor in the skin. There are a few foods that are natural sources of vitamin D. These sources are oily fish, egg yolk, veal, beef, and mushrooms.

Function of Vitamin D

- Vitamin D receptors have been reported in all tissues including: immune system, brain, heart, pancreas, and intestine, suggesting a role in these tissues.
- The function of vitamin D that is most clearly understood is its role in calcium metabolism. However, there is evidence for emerging roles that have implications for health and prevention of various diseases.

Side Effect of Vitamin D: Kidney stones

Muscle Weakness:



- Weight loss or poor appetite.
- Frequent urination.
- Nausea, vomiting, or constipation.

Vitamin E α-Tocopherol sources of vitamin E

Vitamin E in the α-tocopherol form is found in edible vegetable oils, especially wheat germ, and sunflower and rapeseed oil. Other good sources of vitamin E are leafy green vegetables (i.e., spinach, chard), nuts (almonds, peanuts) and nut spreads, avocados, sunflower seeds, mango and kiwifruit.

Function of Vitamin E

- Vitamin E is also used for treating diabetes and its complications.
- It is used for preventing cancer, particularly lung and oral cancer in smokers; colorectal cancer andpolyps; and gastric, prostate, and pancreatic cancer.
- Vitamin E is sometimes used for improving physical endurance, increasing energy, reducing muscle damage after exercise, and improving muscle strength.
- Some people apply vitamin E to their skin to keep it from aging and to protect against the skin effects of chemicals used for cancer therapy (chemotherapy).

Side Effect of Vitamin E: Nausea and vomiting, Diarrhea, Headache, Rash, Fatigue or Weakness, Blurry vision, problems with Ovaries in female and testes in males.

Vitamin K Phylloquinone | Menaquinones The primary sources of vitamin K:-Sources of phylloquinone are green leafy vegetables (i.e., parsley, spinach, collard greens, and salad greens), cabbage, and vegetables oils (soybean, canola, olive). Menaquinones are also found in fermented foods such as fermented cheese, curds, and natto (fermented soybeans).

Function of Vitamin K

- Vitamin K acts primarily in blood clotting,
- Proteins and the mineral calcium are involved in making a blood clot.
- Vitamin K is essential for the activation of several of these proteins.
- When any of the blood clotting factors is lacking, hemorrhagic disease (uncontrolled bleeding) results.
- Vitamin K also participates in the metabolism of bone proteins, most notably osteocalcin. Without vitamin K, osteocalcin cannot bind to the minerals that normally form bones
- Vitamin K is stored in the liver.
- Side Effect of Vitamin K
- flushing,
- injection site pain or discomfort,
- taste disturbances,
- dizziness

,

- Rapid or weak pulse

- profuse sweating, low blood pressure (hypotension)

Water Soluble Vitamins	
Vitamin:	Name:
B1	Thiamine
B2	Riboflavin
B3	Niacin
B5	Pantothenic Acid
B6	Pyridoxine
B7	Biotin
B9	Folate
B12	Cobalamin
C	Ascorbic Acid

Sources of vitamin B

- Whole grains (brown rice, barley, millet)
- Meat (red meat, poultry, fish)
- Eggs and dairy products (milk, cheese)
- Legumes (beans, lentils)
- Seeds and nuts (sunflower seeds, almonds)
- Dark, leafy vegetables (broccoli, spinach, kai lan)
- Fruits (citrus fruits, avocados, bananas)

- **Function of Vitamin B:** Thiamin (vitamin B-1):-The heart, liver, kidney, and brain all contain high amounts of thiamin. The body needs thiamin for:
  - breaking down sugar (carbohydrate) molecules from food
  - creating certain neurotransmitters (brain chemicals)
  - producing fatty acids
  - synthesizing certain hormones

Riboflavin (vitamin B-2):-Energy production and helping the body break down fats, drugs, and steroid hormones.

Niacin (vitamin B-3):-The body converts niacin into a coenzyme called nicotinamide adenine dinucleotide (NAD). NAD is a necessary part of more than 400 different enzyme reactions in the body, the highest of all vitamin-derived coenzymes.

- changing the energy in carbohydrates, fats,
- proteins into a form the body can use
- metabolic processes in the body's cells
- communication among cells
- expression of DNA in cells

Pantothenic acid (vitamin B-5):-Pantothenic acid is necessary for the body to create new coenzymes, proteins, and fats.
Red blood cells carry pantothenic acid throughout the body so it can use the nutrient in a variety of processes for energy and metabolism.

Vitamin B-6:-Vitamin B-6, or pyridoxine, plays a role in more than 100 enzyme reactions. The body needs vitamin B-6 for:

- amino acid metabolism
- breaking down carbohydrates and fats
- brain development
- immune function

Biotin (vitamin B-7):-Manufacturers add biotin to many hair, skin, and nail supplements. However, the NIH state that there is not sufficient evidence to conclude whether taking extra biotin helps with hair, skin, or nails. Some people believe that biotin may help with psoriasis.

- breaking down fats, carbohydrates, and protein
- communication among cells in the body
- regulation of DNA

Vitamin B-12:-Vitamin B-12 contains the mineral cobalt and is sometimes called a "cobalamin."

The body uses vitamin B-12 for:

- creating new red blood cells
- DNA synthesis
- brain and neurological function, fat and protein metabolism

Symptoms of a vitamin B complex overdose include: excessive thirst, skin conditions, blurry vision, nausea, vomiting, increased urination, diarrhea, abdominal cramps.

Sources of vitamin C: Citrus fruits such as orange, kiwi, lemon, guava, grapefruit, and vegetables such as broccoli, cauliflower, Brussel sprouts and capsicums are rich, natural sources of vitamin C. Other vitamin C-rich fruits include papaya, cantaloupe and strawberries.

- Functions of Vitamin C: also known as ascorbic acid, is necessary for the growth,development and repair of all body tissues.
  - It's involved in many body functions, including formation of collagen,absorption of iron, the immune system, wound healing,
  - the maintenance of cartilage, bones, and teeth

Side effects of vitamin C:

- Redness and warm feeling of the skin, or flushing.
- Headache.
- Nausea, vomiting, or diarrhea.
- Upset stomach during or after eating.

First-Aid: Role of Pharmacist in emergency

Kartikey Mehra, D. Pharm I Year

Introduction

Emergency medicine is an interdisciplinary area that covers medical care in an emergency room, trauma center and intensive care unit. It also provides prehospital emergency medical service and disaster medicine. Pharmacists are expected to play major roles as a member of the emergency medical team. The roles of pharmacist include inventory management, formulary management, administration guidance, medication delivery, identification of a tablet, analysis of intoxicating substance, and therapeutic drug monitoring.

As trusted and accessible members of the health care team, hospital pharmacists and pharmacy technicians can help patients and support hospital staff by responding to drug consult requests, checking code carts, responding to codes, gathering medication histories, distributing medications, and replenishing trays and kits. Hospital pharmacists are in a position to help emergency response teams treat incoming patients and ensure continued care for other patients in the hospital. They can also take leadership roles in terms of emergency preparedness and designing hospital disaster response plans and protocols that include managing medication use and distribution, providing step-by-step guidance documents, and serving as response coordinators.

Emergency and public health preparation and response impacts the entire profession. Natural disasters can cause damage and patient harm. Recently, heavy rains pummeled my home state of West Virginia, resulting in historic flooding that has caused extensive property loss, destruction, and more than two dozen deaths. Community-based pharmacists in Rainelle administered tetanus shots to the local community, offered blood pressure and glucose checks, provided first aid, and helped those affected cope with the situation.

The accessibility of community pharmacists makes them an excellent source for emergency care when roads are closed and patients are unable to get to the hospital or see their physician. They can provide patient assessments and triage patients. Community pharmacists can also provide emergency refills of medications, administer vaccinations, and volunteer to help at shelters.

We are fortunate to have a number of pharmacists working for and with public health departments to develop response plans, recruit and prepare pharmacists, and coordinate the engagement of pharmacists to best serve their communities. Read page 63 to learn about efforts to connect pharmacy and public health during a declared pandemic.

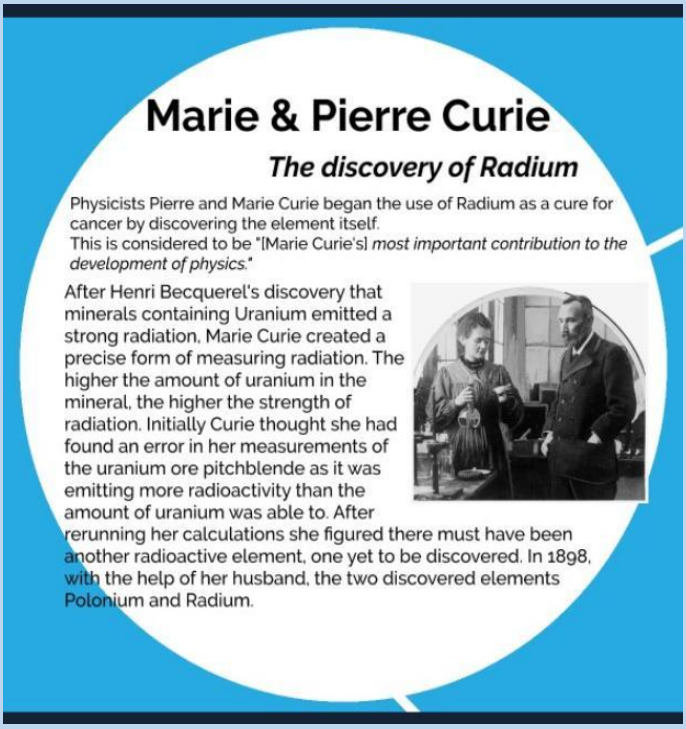
I strongly encourage you to contact your state pharmacy associations and public health departments to learn how you can get involved with disaster preparedness and public health response to assist your patients and your neighbors in emergency situations or a public health crisis.

We hope more pharmacists will join the emergency and disaster medicine and contribute to extend a hand to the sufferers.

Radio Therapy-A Hope for Cancer Patient

Pallavi Yadav and Prachi Tripathi, D Pharm II- Year

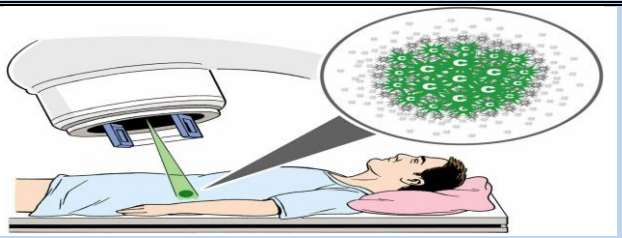
Discovery of Radiography



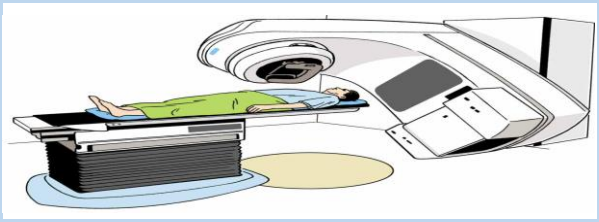
The Therapy

Radiotherapy

What is radiotherapy?



Radiotherapy uses strong **x-rays**to kill cancer**cells**. It can be used on many types of cancer.

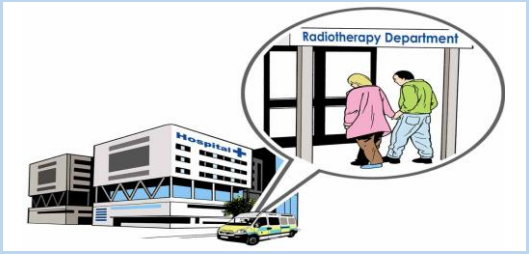


Radiotherapy is given by a machine. This sends x-rays to the part of your body where the cancer has been found.

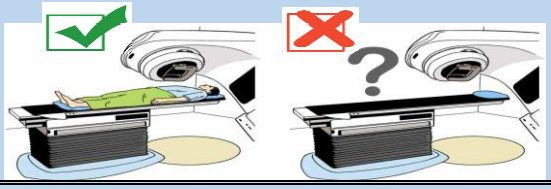
You will usually have a short treatment every day.

The number of treatments you have will depend on what kind of cancer you have. Every person will be different.

Radiotherapy - what happens



You will have your treatment in the radiotherapy department of the hospital. It will be done by a person called a **radiographer**.



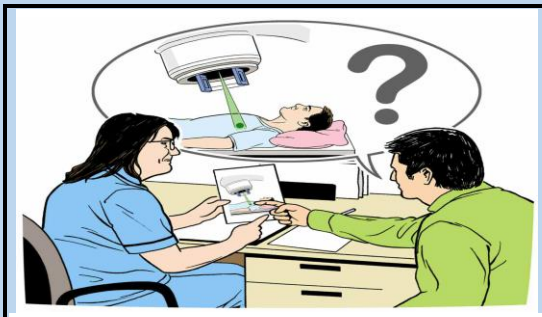
It is very important to go to every treatment. If you miss one, it may not work as well.

Radiotherapy

If you have a long way to travel each day for your treatment, then ask your supporter if they can drive you to the hospital.

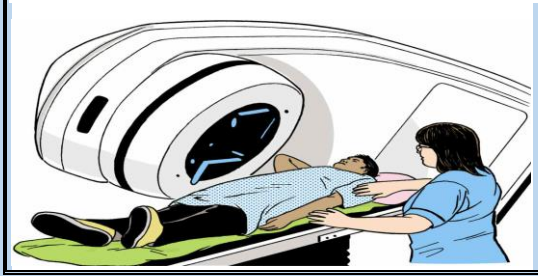
Some hospitals provide transport. Charities and support groups sometimes do this too.

Ask the staff in the radiotherapy department about this.

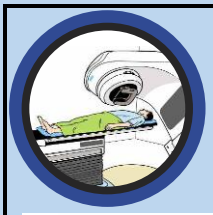


It's good to ask any questions and talk about anything that is worrying you.

You may be able to go and see the radiotherapy department before your treatment, so that you know what will happen.

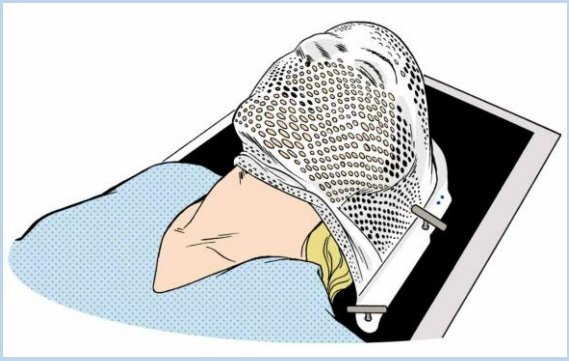


When you come for your treatment, the radiographer will help you to lie down in the right position.



Radiotherapy

You will then have to keep very still while the radiotherapy is happening.



If you are having radiotherapy on your head, you might have to wear a special mask on your face to help you keep still.

The radiographer will then have to leave the room, so they are protected from the strong x-rays. But don't worry, they can still see and hear you and talk with you.

Side Effects of Radiation Therapy

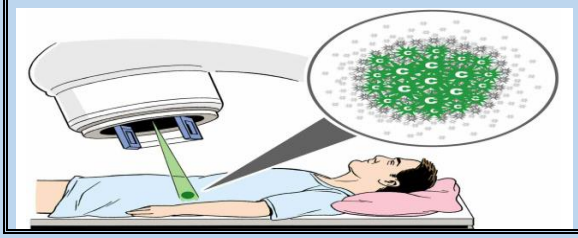
- Most side effects begin during the second or third week of treatment. Doctors and nurses may prescribe medications to help with these side effects.
- Side effects, like skin redness, are generally limited to the area receiving radiation.
- Fatigue is a common side effect for all cancer patients.
- Side effects may last for several weeks after the final day of treatment.

Side effects vary based on a patient's medical profile or diagnosis

Word Bank

Radiographer
A person who takes scans and x-rays of people's bodies. They can also give people radiotherapy treatment.

Side effects
These are things that happen because of your treatment, such as feeling tired or sick.



X-rays
X-rays are powerful rays or beams that can be used to treat cancer.

Correct Administration of Drug in Eye

Smriti Shukla, D.Pharm II year

All though eye treatment is an important aspect of patient care, People may not always be aware of the implication of inadequate treatment of ophthalmic condition.

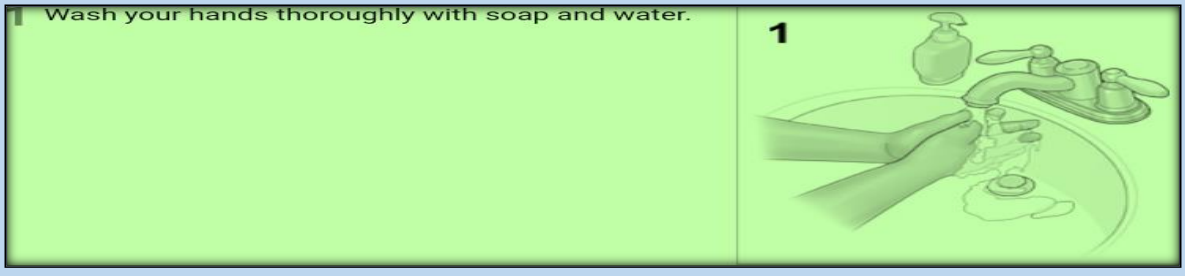
Topical eye treatment, including eye drops and ointments are governed by the same controls as medication administrated by other routes. The pharmacist and nurses play an important role in safe administration of medication and patient compliance during therapy.

BIOAVAILABILITY OF DRUGS APPLIED TO THE EYE EXTERNALLY

There are following forms of the most frequently used ocular therapeutics: eye drops, ointments and inserts.

- In dependence on the physico chemical properties of the therapeutic substance and the kind of disease one has to formulate the forms of the drug in the manner to obtain its maximal bioavailability. By increasing viscosity one can keep the watery solutions in the conjunctival sac for around 60 minutes.
- The time of the contact of the drug given in the form of suspensions is limited mainly by the viscosity of the solution and the size of the molecules suspended in it.
- The ointments stay on the surface of the eye up to 2 hours, the ocular inserts secure a study flour of the therapeutic substance up to 7 days.
- The compound penetrate to the anterior chamber aqueous mainly through the cornea there for the physiological factor of the lacrimal fluid, the properties of the cornea are influencing barrier by the therapeutic substance.

HOW TO USE EYE DROPS PROPERLY



2 Check the dropper tip to make sure that it is not chipped or cracked.

3 Avoid touching the dropper tip against your eye or anything else - eyedrops and droppers must be kept clean.

4 While tilting your head back, pull down the lower lid of your eye with your index finger to form a pocket.

5 Hold the dropper (tip down) with the other hand, as close to the eye as possible without touching it.

6 Brace the remaining fingers of that hand against your face.

7 While looking up, gently squeeze the dropper so that a single drop falls into the pocket made by the lower eyelid. Remove your index finger from the lower eyelid.

9 Place a finger on the tear duct and apply gentle pressure.

10 Wipe any excess liquid from your face with a tissue.

11 If you are to use more than one drop in the same eye, wait at least 5 minutes before instilling the next drop.

12 Replace and tighten the cap on the dropper bottle. Do not wipe or rinse the dropper tip.

13 Wash your hands to remove any medication.

Safe Administration of Medicines into Eyes

Jayanti Devi, D. Pharm IInd year

Introduction

Eyes are the most precious organ of our body. The health of eyes is critical to overall happiness and wellbeing. Like other organs of our body, eyes are subject to stress and injury and can lose full potential if not properly taken care of.

Why is safe administration of medicine into Eyes important?

The safer administration of medicines is important because we need to apply drops and other medicines into the eyes very carefully and with maintaining full hygiene especially when there is any infection or disease to ensure the limit wastage of medicine and to get better and faster result.

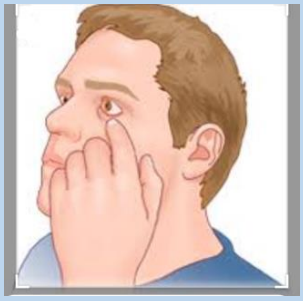
Steps for administering Eye drops

Wash your hands thoroughly with soap and water

Check the dropper tip to make sure that it is not chipped or cracked

Avoid touching the dropper tip against your eyes or anything

While tilting your head back, look upwards, pull down the lower lid or your eye with your index finger to form a pocket.



Hold the dropper (tip down) with the other hand, as close to the eyes as possible without touching it.

While looking up, gently squeeze the dropper so that the a single drop falls into the pocket made by lower lid.

Close your eyes for 2 to 3 minutes

Try not to blink or squeeze your eye lids

Place a finger on a tear duct and apply gentle pressure, wipe any excess liquid from your face using tissue

Replace and tighten the cap of the dropper immediately after use, do not wipe or rinse the dropper tip and wash your hands to remove any medication

Always remember:

Follow the directions carefully.
Do not touch the dropper tip to avoid contamination.
Do not rub your eyes.

Overuse of medication may result in increased eye redness.

Store medication out of reach of children and to be stored in a cool dry place.

Do not miss doses.

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See Appendix
Patient Safety Fact File
by
WHO