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ROLE OF MATHEMATICS IN MEDICINE

МАТЕМАТИКАНЫН МЕДИЦИНАДАГЫ РОЛУ

РОЛЬ МАТЕМАТИКИ В МЕДИЦИНЕ

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ROLE OF MATHEMATICS IN MEDICINE

Abstract

The use of mathematics in the medical field is of utmost importance. Mathematics helps healthcare professionals in their daily work, from calculating medication dosages to interpreting medical research. A working knowledge of simple math is often more than enough to excel in the medical field. Maybe you want to be a doctor, nurse, or even a veterinarian. Being good at mathematics may help you in reaching your dreams! Mathematics plays a crucial role in all healthcare sectors. It can help with the probability or effectiveness of a surgery or medication, assist in the correct dosage to patients, and help assess disease spread. There is definitely a lot more mathematics involved than asking a patient to rate their pain from 1 to 10.

Keywords: *mathematics, medicine, pediatrics, volume, doctor, shapes, sizes.*

РОЛЬ МАТЕМАТИКИ В МЕДИЦИНЕ

Аннотация

Использование математики в медицинской сфере имеет первостепенное значение. Математика помогает медицинским работникам в их повседневной работе: от расчета дозировок лекарств до интерпретации медицинских исследований. Практических знаний простой математики часто бывает более чем достаточно, чтобы преуспеть в медицинской сфере. Может быть, вы хотите стать врачом, медсестрой или даже ветеринаром. Хорошие знания математики могут помочь вам в достижении вашей мечты! Математика играет решающую роль во всех секторах здравоохранения. Это может помочь оценить вероятность или эффективность операции, или лекарства, помочь подобрать правильную дозировку пациентам и помочь оценить распространение заболевания. Определенно, здесь требуется гораздо больше математики, чем просто просить пациента оценить свою боль по шкале от 1 до 10.

Ключевые слова: *математика, медицина, педиатрия, объем, врач, формы, размеры.*

МАТЕМАТИКАНЫН МЕДИЦИНАДАГЫ РОЛУ

Аннотация

Математиканы медицина тармагында колдонуу өзгөчө мааниге ээ. Математика медицина тармагында иштеген адистерге күнүмдүк ишинде аябай чоң жардам берет: дары-дармектердин дозасын эсептөөдөн баштап, медициналык изилдөөлөрдүн интерпретациясына чейин. Математиканы медицина тармагында туура колдонуу дайыма ийгиликке жеткирет. Балким, сиз дарыгер, медайым, жада калса ветеринар болгонуз келет. Математиканы жакшы билүү кыялдарыңызга жетүүгө жардам берет! Математика саламаттыкты сактоонун бардык тармактарында чечүүчү ролду ойнойт. Бул хирургиянын же дары-дармектердин ыктымалдуулугун же натыйжалуулугун баалоого, бейтаптарга туура дозаны табууга жана оорунун жайылышын баалоого жардам берет. Албетте, бул жерде оорулуудан ооруну 1ден 10го чейинки шкала боюнча баалоону сурангандан да көп математика талап кылынат.

Ачкыч сөздөр: *математика, медицина, педиатрия, көлөм, дарыгер, формалар, өлчөмдөр.*

Introduction

Have you ever wondered how mathematics plays a vital role in the medical field? From calculating drug dosages to analyzing medical data, math is essential for healthcare professionals. In this blog post, we will explore the various applications of mathematics in medicine, particularly in pediatrics and doctor professions. We will show case examples of mathematical concepts used within the industry and discuss why it is crucial to have a solid understanding of math when working in healthcare. Therefore, Mathematics and medicine may seem like two entirely separate fields, but in reality, they are closely intertwined. From calculating dosages to analyzing medical data, mathematics plays a crucial role in the world of healthcare. Whether you are a doctor, nurse or researcher, understanding how to use mathematical concepts can improve patient outcomes and save lives. In this blog post, we will look at some examples of how math is used in medicine and explore the benefits it brings to the medical profession. We will also delve into different types of mathematics used in medical field such as shapes and sizes, volume calculations etc., particularly focusing on its application in pediatrics. So buckle up as we dive deep into the fascinating world where mathematics meets medicine!

The Importance of Mathematics in Medicine

Mathematics is a critical tool in the medical profession. It helps doctors and other medical professionals make diagnoses, understand treatment options and plan surgeries. It also is important in research, as mathematical models can be used to simulate diseases and test potential treatments. There are many different types of mathematics used in medicine. Arithmetic is used to calculate dosages of medications and convert between different units of measure. Algebra is used to solve equations that represent problems such as how fast a tumor is growing. Geometry is used to design implants and visualize complex structures inside the body. Trigonometry and calculus are used in imaging techniques such as MRI and PET scans, where they help create three-dimensional images of the body. The benefits of using mathematics in medicine are vast. By understanding and utilizing mathematical concepts, medical professionals can provide better care for their patients. Importance of mathematics in medical profession Mathematics is a critical tool for medical professionals. It helps them to make decisions about patient care, diagnoses and treatments. It also allows them to communicate effectively with other members of the healthcare team. There are many different types of mathematics used in medicine, including statistics, probability, calculus and linear algebra. Each of these has its own specific applications in the medical field. For example, statistics is used to design clinical trials and assess the effectiveness of treatments. Probability is used to predict the likelihood of certain events occurring, such as the chance of a patient developing a particular disease. Calculus is used to model complex biological systems and understand how they change over time. Linear algebra is used to analyze X-rays and MRI scans. The benefits of using mathematics in medicine are numerous. It can help to save lives by providing doctors with the information they need to make informed decisions about patient care. It can also improve the quality of life for patients by helping to ensure that they receive the most effective treatments possible [1-3].

How is mathematics used in medical field?

Mathematics is used in medical field in many ways. It helps in diagnosis and treatment of diseases. It also helps in research and development of new drugs and therapies. Mathematics is used to understand the human body and its functions. It is also used to develop new medical technologies. Some of the ways in which mathematics is used in medical field are: 1. To understand the human body and its functions: Mathematical models are used to understand the human body and its various systems. These models help in understanding how the body works and how diseases develop. They also help in developing new treatments for diseases. 2. To develop new drugs and therapies: Drug development is a complex process that requires mathematical modelling to identify potential targets for new drugs, to understand how these drugs work on the body, and to assess their safety and efficacy. 3. To diagnose and treat diseases: Mathematical techniques are used to diagnose diseases by analyzing patient data, such as blood test results or images from scans. They are also used to develop new treatments for diseases and to monitor the progress of patients during treatment. 4. To research medical conditions: Medical researchers use mathematical techniques to study data from large populations, identify risk factors for disease, and design clinical trials [4, 7].

What are different types of math used in medical field?

In the medical field, mathematics is used in a variety of ways. Different types of mathematics are used to calculate different things. For example, algebra is used to calculate medications and dosages. Geometry is used to calculate the volume of liquids. Trigonometry is used to calculate angles. In addition, calculus is used to calculate things like blood pressure and heart rate. Benefits of using mathematics in the medical field include being able to more accurately diagnose and treat patients, as well as improve patient outcomes. Better understanding of how the human body works and develop new treatments for diseases [4].

Mathematical shapes and sizes in medicine

Many different types of mathematical shapes and sizes are used in medicine. The most common type of shape is the circle. Circles are used to represent everything from cells to organs. They are also used to represent the human body itself. Other common shapes include squares, rectangles, and triangles. These shapes are often used to represent different parts of the body or different areas of the medical field. Math is very important for medical profession because a doctor need to calculate dosages for medication, they need to understand statistics for research purposes, they need to be able to read X-rays and MRIs, and they need to be able to use geometry when performing surgeries. There are many different types of mathematics that are used in medicine, but these are just a few examples. The benefits of using math in medicine are vast. It can help doctors to save lives, it can help them to improve the quality of life for their patients, and it can help them to prevent disease [3].

Mathematical volume in medicine

There are many ways that mathematical volume is used in medicine. One example is when calculating dosages of medication. You need to know the volume of the patient in order to determine how much medication to give. This is important because giving too much or too little medication can

have serious consequences. Other examples include determining the size of organs, calculating blood pressure, and measuring heart rate. Mathematical volume is also used in pediatrics. When a baby is born, doctors need to know the size of the baby in order to properly care for them. They use mathematical formulas to determine the weight and height of the baby. This information is important because it helps doctors know how much food and medication the baby needs. Math is an important part of medicine and there are many different ways it is used. It is important to be familiar with some of these methods so that you can understand what your doctor is talking about when they use them [5].

Mathematics in pediatrics

Mathematics is a critical part of pediatrics, as it is essential for calculating dosages of medications, diagnosing illnesses, and developing treatment plans. Math is also used to track a child's growth and development. calculating infant's weight and Height .For understanding baby health. By understanding basic mathematical concepts, pediatricians can provide the best possible care for their patients [6].

Determination of body weight up to 6 months and after 6 months

1) Body weight increase 800 gm per month at the first half the year

$$m \text{ (by norm)} = m(\text{was born}) + 800 * n$$

n – number of month, if $0 < n \leq 6$

2) Body weight increase 400 gm per month at second half the year

$$m \text{ (by norm)} = m(\text{was born}) + 4800 + 400(n - 6)$$

n – number of month, if $6 < n \leq 12$

Determination of body weight after 1 year up to 10th year and after 10th year

3) After 1st year to 10th year

$$m \text{ (by norm)} = 10 + 2n$$

Where, 10 is approximate weight of 1-year-old child, 2 kg average increase per year. By this formula we can calculate the weight of child 1 to 10 years, n – age of child

4) After 10th year

$$m \text{ (by norm)} = 30 + 4(n - 10),$$

where 30 kg average weight of 10 years old child, 4 kg average increase per year and n – age of child

The calculation of the body length

For 1 to 12 months

Body length up to 1-year increase monthly:

I quarter 3 cm;

II quarter 2.5 cm;

III quarter 1.5 cm;

IV quarter 1 cm

After 1 year, we can calculate body length by using following formula $75+6n$, where 75 cm is an average height of 1-year child, 6 cm – average increase per year, n – age of child

Q.The baby was born weighing 3 kg 200 g Determine a would weight in 5 months, 7 months

$$1) m \text{ (by norm)} = m(\text{was born}) + 800 * n$$

$$m \text{ (by norm)} = 3200 + 800 * 5 = 3200 + 4000 = 7200$$

$$1000g = 1kg$$

$$7200g = 7.2kg$$

$$2) m \text{ (by norm)} = m(\text{was born}) + 4800 + 400(n - 6)$$

$$m \text{ (by norm)} = 3200 + 4800 + 400(7-6) = 8000 + 400(1) = 8400$$

$$8400g = 8.4kg$$

Q.Birth weight is 2 kg 800 g determine the weight of the child in 7 year and 8 year

$$m \text{ (by norm)} = 10 + 2n$$

$$m \text{ (by norm)} = 10 + 2(7) = 10 + 14 = 24kg$$

$$\text{(by norm)} = 10 + 2n$$

$$m \text{ (by norm)} = 10 + 2(8) = 10 + 16 = 26kg$$

*Add 2kg every year

What are the benefits of mathematics in medical field?

In the medical field, mathematics is used in a variety of ways. It can be used to calculate dosages of medication, to track the spread of disease, and to model the human body. Mathematics is also used in medical research to develop new treatments and to test the safety of new drugs. One of the most important uses of mathematics in medicine is calculating dosages of medication. This is essential in ensuring that patients receive the correct amount of medication and that they do not overdose. Mathematics is also used to track the spread of disease. This information can be used to develop new treatments and vaccines. Mathematics is also used extensively in medical research. Researchers use mathematical models to test the safety of new drugs and to develop new treatments for diseases. Some models help researchers understand how diseases spread and how they can be stopped. Overall, mathematics plays a vital role in medicine. It is used to keep patients safe, to develop new treatments, and to understand how diseases spread [3].

Conclusion

In conclusion, mathematics is an essential part of the medical field. It helps doctors to accurately diagnose and treat their patients as well as providing a way for them to communicate with each other about complex issues. Mathematics also provide a reliable way for doctors to measure

ratios and sizes in medicine. Lastly, understanding mathematical shapes can be beneficial when identifying objects in X-rays or CT scans. All these points clearly demonstrate that math plays an important role in the world of medicine and should not be overlooked.

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