

Examples of two problems in the healthcare field that have mathematical solutions...

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Problem A very critical thing in the health care industry is to prescribe the right amount of dosage for the patients. While the matter is of extreme sensitivity for patients of all ages, it is particularly important to ensure that children are given the right amount of dosage as their immune system is relatively less strong than that of the adults. Doctors have to do a lot of calculations on day-to-day basis in order to prescribe the right amount of dosage. Many of these calculations are done with the help of formulae that have been developed as a result of years of research. For example, Young's Rule is commonly used to determine child's dose. The formula for Young's Rule is as follows:

“ Childs Dose = (Childs Age in years/Childs Age in years + 12) x Adult Dose”
(Pharmacy Tech Study, 2014).

Rationale for the use of Young's Rule to determine dosage for children is that there is a lot of variation in the size, weight, and tolerance level of the children. There needs to be a formula that can standardize the determination of dosage for children regardless of these factors. Young's Rule is particularly used when the dosage has not been recommended for the children by the manufacturer. Using Young's Rule, dosage for a child can be determined just by using his/her age as the information. For example, if 500mg of a tablet is prescribed for an adult per day, then to find the dose for a child 10 years of age, the process would be as follows:

$$\text{Child's dose} = 500\text{mg} \times (10 / (10 + 12)) = 500\text{mg} \times 0.45 = 227\text{mg}$$

Problem 2

Doctors and nurses operating in the health care industry have to deal with a lot of complicated cases quite often. New procedures and operations are

being realized for the treatment and cure of diseases that have so far been considered incurable. Rapid advancement in the field of science and technology has provided answers for many unsolved questions. However, it is not easy to convince a patient that needs a surgery to undergo it. This is where statistics plays its role. Doctors gain confidence of the patients by referring to past patients that have undergone the surgeries successfully.

Let's suppose an older adult needs to have a polyp in the vocal cord surgically removed. He is double-minded on whether or not to undergo the surgery because he may not survive anesthesia as he also happens to be a patient of diabetes, asthma, and few other health complications.

Mathematical solution for an old patient that wants to know what are the chances of survival after being given surgery under general anesthesia is providing him with the statistics mentioning the survival rate for patients of the same age in the past.

The rationale for providing the patient with the statistics is that it would help him make informed decision about the surgery. Not only would this educate the patient on the chances of survival, but this would also spare the doctors the guilt in case the patient dies from anesthesia.

References:

Pharmacy Tech Study. (2014). Clarks rule and Youngs rule. Retrieved from <http://www.pharmacy-tech-study.com/dosecalculation.html>.