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Mathematics and Science.Pharmacy.01

CarolineO'Hare

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Evaluating the Need for Creation of Quality Metrics Regarding Concomitant use of Antifungals and Opioids

To enhance Medicare & Medicaid's efforts to combat the opioid epidemic, information was collected to standardize quality of care regarding the prescribing of opioids and antifungal agents. The objective of this study is to evaluate the effect of antifungal agents as pharmacokinetic enhancers to determine if there is a need for the creation of quality metrics concerning their concomitant use with opioids. Utilizing an academic search engine, articles detailing the use of opioids and antifungal agents were collected. Data from each article was categorized into topic/study design, participant characteristics, outcomes, results, and important notes, and used to evaluate the relationship between antifungals and opioids. There is sufficient evidence of clinically significant interactions between the two drug classes, depending upon the metabolic pathway affected. A quality metric of a maximum milligram per day dosage parameter for opioids when used with triazole antifungals is recommended. A quality metric of avoidance of terbinafine with the use of opioids that rely upon the CYP2D6 pathway is recommended due to decreased efficacy of the analgesic effects of opioids coupled with an increased risk of adverse drug reactions of both agents. The creation of quality metrics would aid in identification of associated risks and varying effects of antifungal agents when concomitant use with opioids is deemed necessary.

Mathematics and Science.Pharmacy.02

SierraMullen

Southwestern Oklahoma State University

Evaluating and Developing Quality Metrics Regarding the Concomitant Use of Opioids and Gabapentinoids

Background:

The opioid epidemic was declared in 2017, and the Centers for Medicare & Medicaid Services (CMS) aimed to gather information to compose an evidence-based guideline that protects patients and decreases opioid abuse.

Objective(s):

The purpose of this project was to evaluate gabapentinoids combined with opioids to determine if there is sufficient evidence of opioid potentiation to support the development of opioid quality metrics regarding their concomitant use.

Methods:

This was a retrospective literature review project of 5 articles related to gabapentinoids potentiating the effects of opioids. A search of articles involving the use of opioids and gabapentinoids was conducted utilizing an online academic search engine. The following limiters were applied to all searches: peer reviewed, full text, libraries worldwide, and published between 2008-2018.

Results:

Based upon the analysis of the 5 gabapentinoid articles, a quality metric limiting milligrams per day of gabapentin is recommended. The maximum dosage of gabapentin should not exceed 900 milligrams per day due to the evidence of increased death and respiratory depression that occurs at increased dosages. There needs to further research conducted regarding Lyrica and opioids.

Conclusions:

The implementation of a standardized quality metric related to gabapentinoids and opioids would assist in identification of potentially hazardous prescribing patterns and monitoring of patient care.

Mathematics and Science.Pharmacy.03

ChloeWilliams

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Developing Quality Metrics Regarding the Concomitant Use of Opioids and Benzodiazepines and Benzodiazepine-Like Hypnotics

Background: In response to the opioid epidemic and its effects, the Centers for Medicare & Medicaid Services (CMS) have aimed to gather information to compose an evidence-based guideline that protects the wellbeing of Medicare and Medicaid beneficiaries.

Objectives: The purpose of this project was to evaluate benzodiazepines and benzodiazepine-like hypnotics when used in combination with opioids to determine if there is sufficient evidence of opioid potentiation to support the development of quality metrics regarding their concomitant use.

Methods: This was a retrospective literature review project of eight articles related to benzodiazepines and three articles related to benzodiazepine-like hypnotics potentiating the effects of opioids. The following limiters were applied to all searches: peer reviewed, full text, libraries worldwide, and published between 2008-2018.

Results: Based upon the eight articles related to benzodiazepines, a quality metric of no concomitant use is recommended. Based upon the three articles related to benzodiazepine-like hypnotics, a quality metric of avoiding the combination or implementing a time-dependent limiter between the last opioid dose and the hypnotic dose is recommended.

Conclusions: A standardized quality metric regarding the concomitant use of benzodiazepines and benzodiazepine-like hypnotics could be utilized to monitor and unify the current standards of care and allow a more streamlined approach to the use of opioids in practice.

Mathematics and Science.Pharmacy.04

JordynRichey

Southwestern Oklahoma State University

Medication Therapy Management: Empowering the Patient

Objective: The purpose of this research is to educate and highlight the important beneficial outcomes patients, pharmacists, and other healthcare providers receive from Medication Therapy Management (MTM).

Thesis: In providing the community with a better understanding of Medication Therapy Management implementation, importance, and benefit, there will be further increase in an already noticed increase of quality of patient care and outcomes improvement and further decrease an already noticed reduction in health care expenditures and medication-related adverse events.

Methods: To illustrate the benefit of patient empowerment via Medication Therapy Management to the community, we will gather information by utilizing online resources such as cms.gov, amcp.org, pqaalliance.org, etc.; evaluating journal articles; and conducting interviews with pharmacists who have first-hand experience. After analyzing such data, we will compile the benefits, challenges, and downfalls associated with MTMs.

Summary: We expect to use this research to further aid in patient understanding of MTM benefits and importance in overall patient health. ¶

Mathematics and Science.Pharmacy.05

JordynRichey, RileighRicken, VictoriaThompson

Southwestern Oklahoma State University

Medication Therapy Management: Empowering the Patient

Objective: The purpose of this research is to educate and highlight the important beneficial outcomes patients, pharmacists, and other healthcare providers receive from Medication Therapy Management (MTM).

Thesis: In providing the community with a better understanding of Medication Therapy Management implementation, importance, and benefit, there will be further increase in an already noticed increase of quality of patient care and outcomes improvement and further decrease an already noticed reduction in health care expenditures and medication-related adverse events.

Methods: To illustrate the benefit of patient empowerment via Medication Therapy Management to the community, we will gather information by utilizing online resources such as cms.gov, amcp.org, pqaalliance.org, etc.; evaluating journal articles; and conducting interviews with pharmacists who have first-hand experience. After analyzing such data, we will compile the benefits, challenges, and downfalls associated with MTMs.

Summary: We expect to use this research to further aid in patient understanding of MTM benefits and importance in overall patient health.

Mathematics and Science.Pharmacy.06

ShannaSimmons

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The Happy, Healthy Equine Athlete: Medication Therapies for Joint Health

Equine healthcare is a growing industry, generating over \$601 Million globally in 2017 and expected to keep expanding. While human healthcare has insurance programs to help offset medical costs, equine medical expenses and products are all out of pocket, which drives consumers to look for a proven effective product for their needs. Events promising extraordinary prizes are being hosted, including the recent running of the Pegasus World Cup on January 26, 2019 paying \$16 million in purse money. Owners seek every advantage to keep their equine athletes performing at the highest level, using veterinary services, prescription joint medications, nutraceuticals, in conjunction with compression, ice, and hydro therapy. Joint pain can cause poor performance most notably, however, it can also contribute to poor body composition, attitude, and undue stress. While intra-articular injections provide relief, they are not allowable near race day, as officials in many events test each horse for performance enhancing chemicals and such compounds are forbidden. Additionally, while intended to reduce inflammation in the joint and provide analgesia, overuse of steroid joint injections may cause harm in the long term. This review intends to analyze the safe and effective treatments for prevention of joint disease, along with pain relief for arthritic changes to maximize the longevity and comfort of our equine athletes.

Mathematics and Science.Pharmacy.07

TaylorNelms, ElizabethFranklin

Southwestern Oklahoma State University

Pumping Patient Compliance Through Osmosis: Seriously, Employing Pump to Deliver Medications Orally?

Patient medication compliance is an issue often seen when repetitive dosing is required. Sustained release drug products have been proven effective in improving patient compliance by providing a simplified dosage regimen. A novel sustained release drug delivery system called "Osmotic pump drug delivery system"; was developed to alleviate problems associated with patient compliance. Osmotic pumps allow for less frequent dosing, but retain consistent delivery of a therapeutic dose over the specified time interval. However, very limited to none, visual demonstration of the drug release kinetics is reported in literature, which makes it difficult for students, health care professionals and the general population to understand and appreciate this novel technology. The aim of our study was to produce a visual representation of drug release from the osmotic drug delivery system to aid in the understanding of this innovative technology employed for drug delivery. Two different types of osmotic pumps, Push-Pull Osmotic Pump (PPOP) and Elementary Osmotic pump (EOP) were investigated. Visual release mechanism of Sudafed 24 (EOP) and Glucotrol XL (PPOP) were captured by exposing the aforementioned delivery systems in various mediums (aqueous medium, a medium representing gastric pH, and a medium representing intestinal pH). Photographs were taken at specific time intervals to demonstrate the release of drugs from the osmotic pump delivery systems.

Mathematics and Science.Pharmacy.08

FlavourNubonyin, LisaAppeddu

Southwestern Oklahoma State University

Using the Senses to Raise Awareness of Food Choices

Objective: To pilot sensory activities in the concept of a cooking show to educate students about foods and flavors.

Thesis: Building a plate of food using components which impact taste can raise awareness about food choices and, in turn, increase the potential for healthy lifestyles.

Methodology: Two groups of subjects (Girl Scouts, n = 20) and SWOSU College of Pharmacy students, n = 35) participated in this study. Each group started with plain cooked chicken. Subjects then chose five foods representing sweet, salty, bitter, sour, and umami tastes to complement the chicken. To finish, they added spices, discussed cooking effects, plated the food, and gave verbal descriptions, which employed the senses of smell, temperature, vision, and hearing, respectfully. Subjects learned food facts and healthy tips with each sense. To evaluate knowledge on the senses and their potential effects on healthy food choices, subjects were given a 12-item questionnaire prior to and after these activities. Subjects were also asked which activities they enjoyed and from which they learned the most.

Summary: An overall increase in knowledge occurred, from 40 to 54% in Girl Scouts and 64.5% to 80% in Pharmacy students. There were differences in which activities were most enjoyable versus most educational. Preliminary evaluation of results suggests using the five tastes and other sensory activities can raise awareness about foods, to enable healthy dietary choices.

Mathematics and Science.Pharmacy.09

BryanBozell

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Implementation and Evaluation of a Pharmacist Driven Medication Reconciliation Service in an Academic Medical Center

Transitions of care have been identified in the medical literature as an area in which errors are more likely to occur. Obtaining an accurate medication history is an important step when patients are admitted to a hospital and doing so can decrease preventable medication error rates. Previous studies have shown that pharmacists excel at performing medication reconciliation. With limited resources it will be more cost effective to target high risk patient populations for more intensive medication histories by pharmacy personnel. The objective of this study was to identify the quantity and type of errors corrected on a previous home medication history performed by non-pharmacy healthcare professionals as well as to recognize patients more likely to benefit from medication reconciliation. Patients admitted to the internal medicine service at OSU Medical Center were screened according to predetermined inclusion and exclusion criteria and a medication history was taken by a pharmacist. Demographic data and error rates were documented and categorized. A total of 55 patients' home medication lists were reconciled by a pharmacist, 53 of which had already been reconciled by non-pharmacy staff. Among the 55 patients, 500 errors were identified in the group averaging 9.1 errors per patient. Error rates were highest in patients taking 11+ medications and patients from nursing homes. Pharmacist involvement in medication reconciliation can decrease preventable medication err

Mathematics and Science.Pharmacy.10

ScottLong, LisaAppeddu

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Non-Nutritive Sweetener Aftertaste: A Review of its Causes, Prevalence, and Perception

Objective: The current project is designed to determine whether perception of non-nutritive sweetener (NNS) aftertaste correlates to actual aftertaste, to determine if perception correlates to genes that determine taste, and choice of consumption. **Hypothesis:** The null hypothesis is that perception of aftertaste and actual aftertaste following NNS exposure does not differ. **Methodology:** A literature review was performed on PubMed using the terms "non-nutritive sweetener"; "taste perception"; "perception vs. reality"; and "aftertaste". All relevant "hits" were included. **Summary:** The literature review revealed that NNS aftertaste can occur. Aftertaste may be perceived as bitterness or metallic taste that persists after initial exposure. Additionally, aftertaste was variable in its prevalence and intensity, ranging from none to extreme. This perception of aftertaste has been correlated with variability among subjects in genes that code for taste receptors. The review also revealed that in general, perceptions can influence behaviour and actions. However, it did not reveal studies that examined the relationship between the two. Therefore this literature review supports the objective of the project, to determine a correlation and underlying contributing factors between perception of aftertaste and actual aftertaste with NNS and whether that perception can alter choice of consumption of NNS-containing foods.

Mathematics and Science.Pharmacy.11

MeenuThomas

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The "Polypill" for "Polypharmacy"

Patient medication adherence is a serious barrier to improving patient outcomes. A contributor to poor medication adherence is the concept of polypharmacy; the number of medications being taken is associated with regimen complexity. Adherence is also complicated by multiple disease states, cognitive decline, and perception of taking too much medicine. 3D printed drugs may hold the answer to this problem. 3D printing is the latest advancement in technology which makes it cheaper and faster to create new products which gives it the possibility of creating individualized dosage forms. One example of the ability to create a complex dosage form is the only FDA-approved, commercially available 3D printed tablet, Spritam[®], which is an orodispersible tablet (ODT) that disintegrates in a matter of seconds, reaches T_{max} within minutes, and contains significantly more drug than competing ODT drugs. Another example of using 3D printing to create complex dosage forms is the polypill. It was shown in laboratory settings that 3D printing can be used to combine multiple drugs with different release mechanisms. Another possible advantage is to allow dispensing pharmacies to print individualized dosage forms with their own 3D printer for the patient to pick up. 3D printing offers an economic and patient-friendly solution to poor adherence due to complex medication regimens.