



Decreasing Unintended Overuse of Acetaminophen in the Ambulatory Setting

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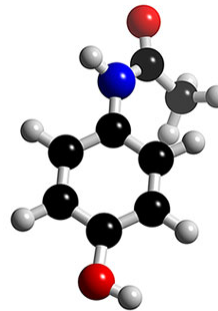
Mid-Atlantic Permanente Medical Group

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Objectives

- Review clinical recommendations**
regarding safe Rx/OTC acetaminophen use
- Raise awareness**
regarding risks of higher than recommended doses
- Discuss the incidence**
of accidental overuse in the general population
- Discuss the methods**
whereby a health plan may encourage reduction of unsafe acetaminophen overuse
- Highlight various patient safety attributes**
of using an electronic medical record in managing medication safety in the ambulatory setting



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Kaiser Permanente

Kaiser Health Plan of the Mid-Atlantic States (KP-MAS) is a nonprofit, public benefit corporation that contracts with individuals and groups for prepaid, comprehensive health care services

KP-MAS contracts exclusively with the Mid-Atlantic Permanente Medical Group (MAPMG) for medical and hospital services for its members

KP-MAS and MAPMG serve over 186,000 members in Virginia at 15 Medical, Imaging and support facilities; medical centers have their own pharmacies

We are determined to decrease the potential for unsafe overuse of acetaminophen in our patient population as part of our ongoing effort to provide the communities in which we serve the best practices related to clinical care



Brief History of Acetaminophen (APAP)

Acetaminophen has been marketed in the United States as an over-the-counter (OTC) antipyretic/analgesic agent since 1960 (UK: Paracetamol)

Initially found in the urine of patients who had taken phenacetin in the late 1880's, in 1948 it was established that APAP was a major metabolite of both acetanilide and phenacetin

APAP blocks the production of prostaglandins, which are chemicals involved in the transmission of the pain message to the brain

Analgesic: different from aspirin and NSAIDs (non-steroidal anti-inflammatory drugs) in that it blocks the pain message at the brain and not at the source of the pain (raises the pain threshold)

Antipyretic: fever reduction has been attributed to its effect on the hypothalamic heat center



Most Common Pain Reliever

Acetaminophen (APAP) or paracetamol (UK) - most widely used analgesic-antipyretic medication in the US and worldwide

Contained in hundreds of products including prescription and over-the-counter (OTC) drugs

US: APAP most common cause of acute liver failure; second most common cause of liver failure requiring transplantation (1)

General population is relatively unaware of the risks of hepatic and renal injury, convulsions, coma, and even death (2, 3) with high doses

1 Lee WM. Acetaminophen toxicity: Changing perceptions on a social/medical issue. *Hepatology* 2007; 46:966-970.
2 Boyer TD, Rouff SL. Acetaminophen-induced hepatic necrosis and renal failure. *JAMA* 1971; 218:440-441.
3 Kaplowitz N. Idiosyncratic drug hepatotoxicity. *Nat Rev Drug Discov.* 2005; 4:489-499.



APAP toxicity

APAP hepatotoxicity is, by far, the most common cause of acute liver failure in both the United States and the United Kingdom

APAP overdose results in more calls to poison control centers in the US than overdose of any other pharmacological substance

Signs and symptoms of toxicity may initially be absent or vague

Untreated, overdose can lead to liver failure and death within days



FDA Safety Paper, January 2004

<http://www.fda.gov/CDER/DRUG/analgesics/SciencePaper.htm>

FDA safety review update identified four factors for fatal or life threatening unintentional APAP overdoses in adults:

- failure by consumers to recognize the ingredients contained in OTC drug products and/or the potential for harm due to exceeding the recommended dose
- wide variety and availability of both OTC and prescription drug products that contain acetaminophen (e.g., single ingredient, combinations, and multiple formulations)
- lack of consumer awareness for the potential to develop serious adverse events from taking two or more different products containing acetaminophen concomitantly
- failure of prescription container labels to list acetaminophen as an ingredient



The Four U's

Unsafe

Greater than 4 grams/day or greater than 3 grams/day in patients over 75 years of age

Unintentional

Patients take multiple products to treat a condition, more than one can contain APAP; brand names not helpful (i.e., DayQuil® and Vicodin®)

Unaware

Patients take higher than recommended doses when symptoms increase; thinking more pain, so more drug needed

Unclear labelling

APAP combined with many other drugs: Rx narcotics for pain relief, OTC antihistamines, decongestants, and cough suppressants for cold/flu symptom relief and fever reduction



Last "U" is YOU : Prescribers and Clinical Staff

Multitude of strengths, combinations, and brand names exist, BUT

Not all PRESCRIBERS are aware

of exactly how much acetaminophen is contained in each medication they prescribe especially if only familiar with the brand name for a particular narcotic combination product

Prescribing habits

which direct patients to choose from a range ("Take 1-2 tablets every 3-4 hours for pain") allow for potential toxicity unless strict parameters are discussed

May be unaware maximum allowable dose for patients over 75 years

is less than the 4 gram/day adult maximum recommended dose

When prescribing combination narcotics that include APAP,

providers have not consistently inquired about the patient's habitual usage of OTC acetaminophen, leaving the potential for inadvertent overuse



Common Brand Names APAP (single drug)

<ul style="list-style-type: none"> •Acephen® •Anacin® Aspirin Free Maximum Strength Tablets® •Capital® and Codeine •Endocet® •Excedrin P.M.® Caplets® •Excedrin P.M.® Geltabs® •Excedrin P.M.® Tablets •Excedrin® Extra-Strength Caplets® •Excedrin® Extra-Strength Tablets •Excedrin® Migraine Caplets® •Excedrin® Migraine Geltabs •Excedrin® Migraine Tablets •FeverAll® •FeverAll® Infants' •FeverAll® Junior Strength 	<ul style="list-style-type: none"> •Gelpirin® •Genapap® •Genapap® Children's •Genapap® Drops Infant's •Genapap® Extra Strength Caplets® •Genapap® Extra Strength Tablets •Genapap® Gel-Coat Caplets® •Genebs® •Genebs® Extra Strength Caplets® •Genebs® Extra Strength Tablets •Goody's® Extra Strength Tablets •Goody's® Fast Pain Relief Tablets •Goody's® Headache Powders •Liquiprin® Drops •Roxicet® , Wygesic® 	<ul style="list-style-type: none"> •Supac® •Tylenol® •Tylenol® Arthritis Pain Extended Relief Caplets® •Tylenol® Meltaways •Tylenol® Concentrated Drops Infant's •Tylenol® Extra Strength Adult •Tylenol® Extra Strength ® •Tylenol® Extra Strength Gelcaps® •Tylenol® Extra Strength Geltabs® •Tylenol® Extra Strength Tablets •Tylenol® Meltaways Junior Strength •Tylenol® Suspension Children's •Tylox® , Vanquish® Caplets®
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Brand Names of Common Combination Products

- Allerest® No Drowsiness (containing Acetaminophen and Pseudoephedrine Hydrochloride)
- Axocet® (containing Acetaminophen and Butalbital)
- Benadryl® Severe Allergy and Sinus Headache Maximum Strength Caplets® (containing Acetaminophen, Diphenhydramine Hydrochloride, and Pseudoephedrine Hydrochloride)
- Bupap® (containing Acetaminophen and Butalbital)
- Dristan® Cold No Drowsiness Formula Maximum Strength Caplets® (containing Acetaminophen and Pseudoephedrine Hydrochloride)



Brand Names of Common Combination Products

- Duradrin® (containing Acetaminophen, Dichloralphenazone, and Isometheptene Mucate)
- Excedrin® Aspirin-Free Caplets® (containing Acetaminophen and Caffeine)
- Excedrin® Aspirin-Free Geltabs® (containing Acetaminophen and Caffeine)
- Excedrin® Quicktabs® (containing Acetaminophen and Caffeine)
- I.D.A.® (containing Acetaminophen, Dichloralphenazone, and Isometheptene Mucate)
- Midol® Menstrual Formula Maximum Strength Caplets® (containing Acetaminophen, Caffeine, and Pyrilamine Maleate)



Brand Names of Common Combination Products

- Midol® Menstrual Formula Maximum Strength Gelcaps® (containing Acetaminophen, Caffeine, and Pyrilamine Maleate)
- Midol® PMS Maximum Strength Caplets® (containing Acetaminophen, Pamabrom, and Pyrilamine Maleate)
- Midol® PMS Maximum Strength Gelcaps® (containing Acetaminophen, Pamabrom, and Pyrilamine Maleate)
- Midol® Teen Menstrual Formula Caplets® (containing Acetaminophen and Pamabrom)
- Midrin® (containing Acetaminophen, Dichloralphenazone, and Isometheptene Mucate)
- Ornex® Caplets® (containing Acetaminophen and Pseudoephedrine Hydrochloride)



Brand Names of Common Combination Products

- Ornex® Maximum Strength Caplets® (containing Acetaminophen and Pseudoephedrine Hydrochloride)
- Pamprin® Maximum Pain Relief Caplets® (containing Acetaminophen, Magnesium Salicylate, and Pamabrom)
- Pamprin® Multi-Symptom (containing Acetaminophen, Pamabrom, and Pyrilamine Maleate)
- Percogesic® (containing Acetaminophen and Phenyltoloxamine Citrate)
- Percogesic® Extra Strength Caplets® (containing Acetaminophen and Diphenhydramine Hydrochloride)
- Phrenilin® (containing Acetaminophen and Butalbital)
- Phrenilin® Forte (containing Acetaminophen and Butalbital)



Brand Names of Common Combination Products

- St. Joseph® Cold Tablets for Children (containing Acetaminophen and Phenylpropanolamine Hydrochloride)
- Sudafed® Sinus & Headache Caplets® (containing Acetaminophen and Pseudoephedrine Hydrochloride)
- Sudafed® Sinus & Headache Maximum Strength Tablets (containing Acetaminophen and Pseudoephedrine Hydrochloride)
- Tylenol® Allergy Sinus NightTime Maximum Strength Caplets® (containing Acetaminophen, Diphenhydramine Hydrochloride, and Pseudoephedrine Hydrochloride)
- Tylenol® Flu NightTime Maximum Strength Gelcaps® (containing Acetaminophen, Diphenhydramine Hydrochloride, and Pseudoephedrine Hydrochloride)
- Tylenol® PM Extra Strength Caplets® (containing Acetaminophen and Diphenhydramine Hydrochloride)
- Tylenol® PM Extra Strength Gelcaps® (containing Acetaminophen and Diphenhydramine Hydrochloride)



Brand Names of Common Combination Products

- Tylenol® PM Extra Strength Gellabs® (containing Acetaminophen and Diphenhydramine Hydrochloride)
- Tylenol® Sinus Gellabs® Maximum Strength Tablets (containing Acetaminophen and Pseudoephedrine Hydrochloride)
- Tylenol® Sinus Medication Maximum Strength Gellabs® (containing Acetaminophen and Pseudoephedrine Hydrochloride)
- Tylenol® Sinus Medication Maximum-Strength Caplets® (containing Acetaminophen and Pseudoephedrine Hydrochloride)
- Tylenol® Sinus Medication Maximum-Strength Gelcaps® (containing Acetaminophen and Pseudoephedrine Hydrochloride)
- Tylenol® Women's Caplets® (containing Acetaminophen and Pamabrom)
- Ultracet® (containing Acetaminophen and Tramadol Hydrochloride)
- Women's Tylenol® Menstrual Relief Caplets® (containing Acetaminophen and Pamabrom)



Common Prescription Narcotic Combinations

- Phenaphen®, Tylenol #3 ® (Acetaminophen and codeine)
- Fioricet® (Acetaminophen, butalbital, codeine, and caffeine)
- Panlor DC® (Dihydrocodeine, acetaminophen, and caffeine)
- Vicodin®, Lorcet® (Hydrocodone and acetaminophen)
- Percocet®, Tylox® (Oxycodone and acetaminophen)
- Talwin® (Pentazocine and acetaminophen)
- Darvocet® (Propoxyphene and acetaminophen)



Kaiser Permanente Integrated Practice Setting

Free-standing pharmacy

in each KP medical center in Northern Virginia

KP Health Plan drug benefit

>95% KP members get Rx filled in KP pharmacies

Ambulatory Care Clinical Pharmacists

available in each medical center

Physician communication and education

is facilitated using EMR/presentations/email

Patient communication and education

is facilitated at pharmacy/in person/online

Formulary management

by a multidisciplinary regional P&T Committee



Methods

Define the scope of the problem

- Reports of any APAP Rx with potentially higher than recommended dosage according to sig, strength and days supply
- Hundreds of prescriptions found initially

Modify the formulary

- All higher strength APAP (>500mg) products deleted from formulary and KPHC drug preference lists

Communicate and educate clinicians

- Email, voicemail, hard copy letter and in-person meetings with individual prescribers



Methods

Engage Staff and Medical Group

- Physician management of their specific list of patients on their panel, supported by physician leaders
- Increased awareness of staff and leadership

Targeted messaging in EMR

- Follow-up patients who still had Rx's in system with potential for high dose
- Decision support – alerts if duplicate orders attempted
- Staff messaging to providers when necessary

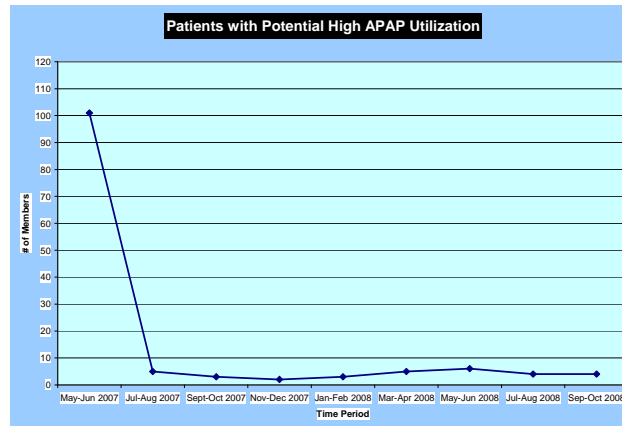
Increase patient awareness of the dangers of acetaminophen overdose

- Alerts and verbal consults when APAP was included in any prescription
- Signage in centers informing patients of risks



Results of APAP Medication Safety Initiative

90% Decrease in Patients with Potentially High APAP Use



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Conclusions

Improved appropriate dosing

of acetaminophen can lead to a significant reduction in potential for risk of liver toxicity and patient harm

A targeted approach to the problem

of acetaminophen overuse using integrated medical records, pharmacy data, clinical staff education, and patient education in our organization has greatly decreased the potential for misuse of this drug in a short period of time

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Conclusions

OTC medications with APAP are abundant;
patients may unknowingly be taking higher than recommended doses of acetaminophen

Specific educational campaigns
for patients and clinicians are necessary to reduce risk of harm from APAP in patient populations

A multidisciplinary health care team
can be successful in creating positive outcomes in medication safety



Transfer of Best Practices

Targeting any commonly misused OTC /prescription drugs
(i.e. cough suppressants, nasal decongestants) with similar implementation methods used by KP-MAS for APAP could add value to an organization's patient safety and medication safety efforts

Various communication processes used by KP-MAS
should be easily transferable to most health care organizations when managing patients and/or prescribing medications; the ability to reach out to staff and patient is essential

Efforts are greatly facilitated
by accurate data reporting and documentation of specific drug prescribing by individual clinicians as well as accurate and organized pharmacy data systems



The KP Team Approach to Medication Safety

