



## Critical eye towards storage and disposal of prescribed medicine

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### ABSTRACT

Drug therapy is the most often used intervention for treatment and prevention of disease. Many patients do not finish these medications and stored in medicine cabinet or thrown away. If these drugs are not properly stored and not properly disposed, these can have a direct impact on public safety, environment, and the health care services. The prescription drug abuse problem in America has grown over the last decade. Also this excess of medication in our home creates significant opportunities for unintentional poisoning, illegal distribution, substance misuse, and environmental contamination. Many steps have been taken by U.S Government, for proper storage and disposal of prescribed medicines. Federal guidelines recommend different ways to dispose the prescription drugs when they are no longer needed. But in India there is no much awareness of proper storage and disposal of prescribed medicines. Thus, there is need for more societal awareness and also Government of India should bring awareness program and law enforcements for proper storage and disposal .of prescribed medicines.

**Key words:** Storage of Drug, Disposal of Drug, Drug abuse, Law enforcement

### INTRODUCTION

Thousands of drugs coming to market and millions of prescriptions are written every day. Many patients do not take or finish these medications as intended by the prescribing physician leaving problem of these unneeded, unwanted or expired medications. 40% of prescription drugs dispensed each year to consumer in the united states are never actually used, instead drugs are either stored in medicine cabinet or thrown away.<sup>1</sup> Many a times these drugs are reused by same patients for same condition or given to our family member for similar condition. Main threat is prescription abuse. National Survey on Drug use and Health (NSDUH) found that over 70% of people who abused prescription pain relievers got them from friends or relatives, while approximately 5% got them from a drug dealer.<sup>2</sup>

In US there is a epidemic of Addiction due to overuse of those stored drugs (opoids, CNS depressants and stimulants) by family members. The prescription drug abuse problem in America has grown over the last decade. Also this excess of medication in our home creates significant opportunities for unintentional poisoning, illegal distribution, substance misuse, and environmental contamination. So in U.S they have become aware of this issue and seriously taken under consideration and carried different programs for storage and disposal of prescribed drugs. In May 2010, the U.S Attorney General office signed a letter of support for two bills one in the House and the other in senate both of which entitled "Secure and Responsible Drug Disposal Act 2009."<sup>3</sup> These bills would make easier to implicate drug take back program.

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In India we are still not much aware and no serious steps taken to bring awareness of proper storage and disposal of prescribed drugs. It is also necessary to educate people about this problem and its consequences. Improper drug storage and disposal can have a direct impact on public safety, the environment and the healthcare services.

### ***Hazards of unsafe storage and disposal of prescribed drugs***

#### **Poisoning**

Keeping medicines after they are no longer needed creates an unnecessary health risk in the home, especially if there are children present. Even child resistant containers cannot completely prevent a child from taking medicines that belong to someone else. In a study looked at cases of accidental child exposure to grandparents medicine, 45% cases involved medicines stored in child resistant containers and involved child less than 6 years.<sup>4,5</sup> Over the counter and prescription drugs have caused 75% of all unintentional poisonings in North Carolina<sup>6</sup>.

There are different cases of poisoning which are been published in American Association of poison control centers 2007 annual report e.g. A 2 year male child consumed methadone, an opioid drug from the bottle and found not breathing. A 4 year female child ingested a discarded fentanyl patch from a trash and caused overdose and death.

#### **Drug abuse**

Prescription drug abuse is the Nation's fastest growing drug problem. This problem of prescription drug abuse in America has grown over the last decade in such a extent that, it is referred as epidemic of prescription drug abuse. The Nation's largest survey of drug use among young people showed that prescription drugs are the second most abused category of drugs after marijuana<sup>7</sup>. The National Institute on Drug Abuse has estimated that 20% of the population in America will use prescription drugs for nonmedical reasons within their lifetime<sup>8</sup>. Many teens today are naïve to the dangers and addictive potential of prescription drugs. They wrongly assume that prescription drugs are less addictive and safe than street drugs as they are prescribed by a

physician. The most common abused prescription drugs are opioids, CNS stimulants and depressants, obtained from a friend, family member, or household medicine cabinet.

The growing abuse endemic is continually reported in different studies. National Institute on Drug Abuse in 2007, almost 10% of 12<sup>th</sup> graders abused with Vicodin<sup>9</sup> (acetaminophen). The North Carolina Youth Risk Behavior Survey (YRBS) reported, 20.5% of high school youths have taken prescribed drugs, oxycontin (opioid pain reliever) at least in their lifetime<sup>10</sup>. In 2011 Prescription Abuse Prevention Plan was expanded upon the Obama Administration Strategy and action is taken on four major areas to reduce prescription drug abuse, Education, Drug monitoring program, Proper medical disposal, and Provide law enforcement. India is also facing Prescription drug abuse problem but the exact data is not available.

#### **Environmental pollution**

Improper disposal of unused medication poses an unknown threat to the environment and our water supplies. Active pharmaceutical ingredients are contaminating the environment and finding their way into our drinking water via human excretion and improper drug disposal. Dozens of pharmaceutical drugs including antibiotics, anticonvulsants, mood stabilizers and sex hormones have been found in the drinking water of an estimated 46 million Americans<sup>11</sup>. Such problem was also noted at different places in India. Also there is risk of developing resistance to different antibiotics, if consumed this contaminated water with antibiotics. These drugs found in water are also harmful to fish and aquatic life. Certain drugs (hormones) can cause male fish to develop female characteristics. These "intersex fish" often do not reproduce.<sup>12</sup>

Thus the negative outcome attribute to unused, stored, or improperly disposed medications make implementing a safer more efficient drug disposal system increasingly important.



### ***Guidelines for proper storage of prescribed drugs***

#### **Organize your medications**

The first step in getting organized is to take a look at all medicines you have. Do this type of inventory every six months, or at least once a year. Start by checking the expiration date. Medicines with expired date should be discarded. Also look for medicines that are discolored, dried out, crumbled, if found discard them. Then look for leftover prescription medicines from previous illness. As far as possible discard these, since you should never try to treat yourself (or anyone else) with left-over prescription medicines.

#### **Where to keep the prescribed medicine**

Once they are organized medicines should be kept in medicine cabinet and keep at safe, cool, and dry place. Many times we see medicines are kept in door compartment of refrigerator, which should be discouraged. Only few medicines require to be kept in refrigerator and should be kept as per instructions.

#### **How to keep the prescribed medicine**

If there are children around, lock up your medicines in a cabinet or a drawer. It is also necessary to lock up any controlled substances (pain killer, CNS stimulants) that have been prescribed and kept out of hands of young's who may get abuse of prescribed medicines which is a serious problem. Keep your medicines separate from those of your family members to prevent taking wrong medicine by mistake. Keep medicines in good lighting, so that you can see properly which medicine and make sure you are taking the right medicine. Keep the medicine in the bottle it came in (some drugs kept in amber colored bottle as to avoid sunlight) and you can see the information on bottle if needed. Never mix different medicines in the same bottle and end up taking wrong medicine. Keep lids on your pill bottles tightly closed. If there is cotton in the pill bottle when you first open it, remove the cotton as cotton can absorb moisture and spoil the medicine.

### ***Guidelines for proper disposal of prescribed drugs***

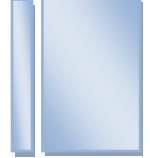
Proper disposal of drugs is a growing health problem. FDA worked with the White House office of National Drug Control Policy (ONDCP) to develop the first consumer guidance for proper disposal of

prescription drugs issue by ONDCP in Feb 2007 and updated in Oct 2009. You have to follow any specific disposal instructions on the drug label or patient information that accompanies the medication. Federal guidelines recommend different ways to dispose your prescription drugs when they are no longer needed.

#### **Medication Take-Back Programs**

Take back program afford proper drug disposal and remove untoward risks to both the environment and the community. This mode of disposal is practiced in U.S. There are different modes of take back program. "Permanent collection sites" located in the lobby of law enforcement agencies. Each location contains a locked, mounted steel collection bins in the lobby. Unwanted medications are dropped into these bins. Bins are emptied by Law Enforcement officers and ultimately incinerated at Department of Environment quality (DEQ) permitted facilities. DEQ also sponsors "community medication" take-back events called "Clean Out Your Medicine Cabinet". Many community organizations also sponsor medication take back events, but should have approval from Drug enforcement Agency (DEA). Community based programs have the greatest impact<sup>13</sup>. "One day" medication take back programs are arranged in U.S by Drug Enforcement Administration. First one Day medication take back program was held on Sep 25 2010, and showed great success across the U.S which collected over 121 tons of unused, expired or unwanted medications. There National take back program was scheduled on October 26 2013. "Mail-back program" called Maine's program launched in 2007, which allows residents to safely dispose of unwanted pharmaceuticals by providing envelopes to mail-back the unused drugs to DEA.<sup>14</sup> The success and positive results from take back program strongly supports this as the best method of disposal in U.S.

Legal limitations could prevent take back program or pharmacies from accepting medicines containing controlled substances and therefore, these programs may be hard to find. According to "Controlled Substance Act" a law enforcement officer must be present for disposal of controlled substances. Also other barriers include cost associated with staging an



event or hosting a take back program and cost for destruction of all collected medicines.<sup>15</sup>

### Disposal in Household Trash

If no medicine take back program is available in your area you can dispose medicines in the household trash. Most of the drugs can be thrown in the trash, but consumers should take certain precautions before tossing them out. You have to remove any personal identifiable information from prescription bottle or pill packages. Take unused, unneeded or expired prescription drugs out of their containers and mix them with undesirable substances (like used coffee grounds or kitty litter, spoiled food), put the mixture in an empty can or bag or sealed in an opaque container, before you throw them away. Through container in trash on the same day the trash is collected, as safely secure from children, pets and others. This is to be later incinerated or placed in a government approved solid waste land fill.

### Flushing the medicines

FDA recommends, if there is no such take back program for control substances, the most effective way to completely eliminate potential for harm is to flush (flushing down the toilet or washing down the sink). FDA believes that the risk associated with accidental exposure to this small selected list of medicines (control substances) far outweighs any potential risk associated (even single dose may be fatal) with disposal by flushing. Fentanyl patches after use should be flushed down the toilet after folding the patch in half so that the sticky sides meet.

There is lot of controversy about flushing of the drugs. DEC (which protects drinking water supplies) recommends that no drug to be flushed to prevent water pollution. Read insert directions unless otherwise stated do NOT flush medication down the drain toilet.

### Other measures

#### Proper education to society

It is very much necessary to educate the people in our society about proper storage and disposal of prescribed medicines. In India there is no much awareness of this issue. Before it becomes a problem, several steps has to be taken at different levels.

Awareness program can be carried out by medical students in different medical colleges, doing a survey and educating the community about proper storage and disposal of prescribed medicine. This can be done under dept of pharmacology or Preventive and social medicine (PSM).

Also our Government should bring awareness program and law enforcements for proper storage and disposal of prescribed medicines. Pharmacists and other social groups along with health- cares should come forward and work on take back program of prescribed medicines.

Last but not the least, Doctors should prevent Over prescription, which will help to minimize the problem of unused medicines and its storage and disposal problem. Also this may help to reduce the economical burden and chances of resistance in the society. Check should be kept on over the counter drugs.

### CONCLUSION

Thus small steps today may help us to avoid major problems in future. So it is very necessary to look critically to this important but neglected aspect of proper storage and disposal of prescribed medicines.

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