



## The Misuse of Drugs

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The use of "performance-enhancing" drugs by soldiers has become a concern to the Army's commanders and medical personnel alike. Leaders at all levels therefore need a more complete base of knowledge regarding such drugs and their possible abuse by soldiers in their units.

No drug is completely without risk. Even aspirin, an effective drug that has been known for more than a century, can have undesirable effects. But since the benefit-to-risk ratio for aspirin is high, it is prescribed with near impunity. The same cannot be said for most other drugs. The risks soldiers take if they use some drugs are significant. In fact, the end result of self-prescribing can be premature death.

Apparently, though, soldiers who are sufficiently motivated to perform well in physical activities will explore any available means of improving that performance. These means include *ergogenic* drugs.

Ergogenic drugs are any substances used to gain an edge in performing a physical act. Using these substances—whether they are legal or not—is called "blood doping," or simply "doping." One definition of "doping" is "the administration of any substance foreign to the body or of any physiologic substance taken in abnormal quantity or taken by an abnormal route of entry into

the body with the sole intention of increasing performance."

Most of these substances are legal prescription and over-the-counter drugs produced by reputable pharmaceutical companies. But some of them are illegal; that is, they are either illegal to possess or illegally manufactured. Finally, some of the "doping" substances are legal drugs, obtained legally, but used in a way that the manufacturer never intended.

### RISKS

Soldiers of all ranks, MOSs, branches, races, and ages, and even their family members, have approached medical personnel concerning the value of doping agents and methods of using them. Although most of the substances they ask about are quite legal and *inexpensive*, they are also easily misused and offer more risks than benefits.

The accompanying chart shows some examples of drugs that can be beneficial if used as intended but that also have possibilities for abuse:

- Stimulants such as those listed may be obtained over the counter or by prescription. In addition to stimulating the brain's center for wakefulness, however, they also stimulate the heart and can cause irregular beats and rhythms.

They can put the user at risk for heat injury.

- Anabolic steroids are easy to obtain by prescription from a physician, but they can also be obtained from illicit sources such as fitness gyms and nutrition "experts." These drugs cause high blood pressure, heart disease, and acne. In men, they can reduce the size of the testicles; reduce sperm production and lead to impotence; enlarge the breasts; cause premature baldness; stunt the growth of bones; and inflame the prostate gland. In women, they can cause a deepening of the voice, excessive facial hair growth, and abnormal menstrual cycles. In both sexes these drugs can cause an increase in aggressiveness and sexual appetite, which could result in aberrant sexual and criminal behavior. After using anabolic steroids, the user can develop a profound depression, and could be suicidal.

- Diuretics are used to reduce weight quickly and also to reduce the concentration of drugs in the urine (as a "masking agent" for those drugs). By causing abnormal water loss, a diuretic can cause dehydration, heat injury, excessive loss of body salts such as potassium, and abnormal heart rhythms and muscle contractions.

- Narcotic pain killers produce a sensation of euphoria and a false sense of invincibility and athletic prowess.

## COMMON ERGOGENIC AIDS

| EXAMPLE<br>(Generic Name/Trade Name) | MANUFACTURER'S INTENDED USE                                                                                                       | ADVERSE EFFECTS IF MISUSED                                                                                                                                                  |                                                                   |  |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|--|
| <b>Stimulants</b>                    |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| caffeine/Vivarin                     | To stay awake.                                                                                                                    | All stimulate heart and cause irregular beats and rhythms. User risks heat injuries.                                                                                        |                                                                   |  |
| amphetamine/Dexedrine,<br>Obetrol    | To control appetite.                                                                                                              |                                                                                                                                                                             |                                                                   |  |
| ephedrine/Broncotabs,<br>Primatene   | To control asthma.                                                                                                                |                                                                                                                                                                             |                                                                   |  |
| isoproterenol/Medi-Haler-ISO         | To control asthma.                                                                                                                |                                                                                                                                                                             |                                                                   |  |
| methylphenidate/Ritalin              | To control hyperactivity.                                                                                                         |                                                                                                                                                                             |                                                                   |  |
| phenylpropanolamine/Entex,<br>Contac | For colds.                                                                                                                        |                                                                                                                                                                             |                                                                   |  |
| phentermine/Fastin, fenamin          | To suppress appetite.                                                                                                             |                                                                                                                                                                             |                                                                   |  |
| <b>Anabolic Steroids</b>             |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| metandienone/Danabol                 | All of these increase the synthesis of protein and lean muscle mass, which is said to improve strength and endurance.             | High blood pressure, heart disease, acne; abnormal sex characteristics, premature baldness; increased aggressiveness and sexual and criminal behavior; profound depression. |                                                                   |  |
| nandrolone/Durabolin                 |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| stanozolol/Stroma                    |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| testosterone/Malogen                 |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| methyltestosterone/Andriol           |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| oxandrolone/Anavar                   |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| oxymetholone/Adroyd                  |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| <b>Diuretics</b>                     |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| furosemide/Lasix                     | Eliminate fluids from the tissues in certain conditions.                                                                          | Dehydration, heat injury, excessive loss of body salts (potassium), abnormal heart rhythms and muscle contractions.                                                         |                                                                   |  |
| spironolactone/Aldactone             |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| chlorothalidone/Hygroton             |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| bumetanide/Bumex                     |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| acetazolamide/Diamox                 |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| ethacrynic acid/Edectrin             |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| <b>Narcotic Pain Killers</b>         |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| codeine/Codipertussin                | Euphoria, false sense of invincibility and athletic prowess; inability to recognize injury; physical and psychological addiction. |                                                                                                                                                                             |                                                                   |  |
| dihydrocodeine/Synaiges              |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| nalbuphine/Nubain                    |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| pentazocine/Talwin                   |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| trimeperidine/Demerol,<br>Mepergan   |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| opium/Paragoric                      |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| oxycodone/Vicodan                    |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| <b>Non-Narcotic Pain Killers</b>     |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| aspirin                              |                                                                                                                                   |                                                                                                                                                                             | Stomach upsets, ulcers bleeding, nausea, and changes in behavior. |  |
| acetaminophen/Tylenol                |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| difunisal/Dolobid                    |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| ibuprofen/Motrin                     |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| indomethacin/Indocin                 |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| sulindac/Clinoril                    |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| naproxen/Naprosyn                    |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| <b>Beta Blockers</b>                 |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| nadolol/Corgard                      | Lowers blood pressure.                                                                                                            | All limit heart's ability to respond to work loads; can limit the way body fuels are used; and may increase heat injury.                                                    |                                                                   |  |
| pindolol/Visken                      |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| atenolol/Tenormin                    |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| propranolol/Inderal                  |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
| timolol/Timoptic                     |                                                                                                                                   |                                                                                                                                                                             |                                                                   |  |
|                                      | Lowers heart rate.<br>Controls glaucoma by lowering the pressure in the eye.                                                      |                                                                                                                                                                             |                                                                   |  |

This list is not complete, and the examples cited are in no way meant to be pejorative. See article text for additional discussion of possible abuses.

Since these drugs raise the pain threshold, the user may not recognize an injury and, as a result, may sustain a more serious injury. The user may further risk injury if he perceives a dangerous situation as safe. These drugs are addictive physically as well as psychologically. All of them can be obtained by

prescription or purchased on the streets.

- Non-narcotic analgesics can cause stomach upset, ulcers, bleeding, nausea, and changes in behavior.
- Beta blockers can produce a calming effect and reduce tremor or trembling. These drugs limit the heart's ability to respond to work loads; can

severely limit the way body fuels are used; and since they limit the body's ability to respond and adapt, may increase the risk of heat injury.

Some of the other drugs that are available and subject to abuse include the following:

- Ginseng. Harvested as a root, taken

in the form of a tea, it is claimed to enhance strength and sexual prowess.

- Amino acid supplements (processed protein, plant and animal). Although touted as a way to increase bulk, they have no advantage over a well-planned diet.

- Plant steroids. Various plant parts, touted as the "safe alternative" to anabolic steroids, offer no benefit.

- Mega-vitamins. Soldiers may take these on the assumption that if a little is good, a lot is better. Actually, though, water-soluble B and C vitamins taken in excess are excreted in the urine, doing neither good nor harm. On the other hand, fat-soluble A and D vitamins can be stored in harmful concentrations.

- DMSO. An anti-inflammatory cream, it is claimed to be safe but has not been approved for human use. It can decrease the pain from over-used soft tissue, but it has not been proved safe for the liver and kidneys.

- Cold capsules. Preparations such as Sudafed, Actifed, Entex, and Triaminic are used by some to help them sleep, by

others to stay awake, and still others to curb appetite.

This is a very short list of some of the substances available to and, unfortunately, used by our soldiers in the hope of improving their performance.

How well do the drugs work in fulfilling those hopes? Many of the claims made for over-the-counter and off-the-shelf training aids are unfounded; they may be advertised under personal testimonials or unpublished studies. Most drugs do have a placebo effect; that is, part of the reason a drug user feels the intended effect is that he expects to feel it. In the case of some of these drugs, however, there is a noticeable improvement in performance.

The ethical and moral issues in the use of ergogenic aids in a peacetime Army that is training for modern battle have not been considered here. Nonetheless, because of the widespread use of drugs by the general public—whether these drugs are legal or not—the Army should develop more awareness of them and educate its leaders and soldiers to

become more intelligent and healthier consumers.

Several sources of information and assistance are available to all soldiers and their leaders: Master Fitness Trainers, family physicians, brigade surgeons, the U.S. Olympic Committee's toll-free drug hotline (1-800-223-0393), and sports medicine physicians (board-certified family physicians who are trained in sports medicine). In the Army, sports medicine physicians include Major John Reasoner (Eisenhower Medical Center, Fort Gordon); Major Bill Roundtree (Martin Army Community Hospital, Fort Benning), Major Wade Lillegard (Madigan Army Medical Center, Fort Lewis), and me—Dr. John M. Henderson (6262 Hamilton Road, Columbus, GA 31995-9517; office (404) 324-6661, home (404) 568-3548.)

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# Killing Enemy Armor

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As a member of the Army's Armor/Antiarmor Mobile Training Team, I learned (during visits to many of our Army's divisions, separate brigades, and major command headquarters) that many infantrymen and other combined arms leaders are still rigidly fixed to the principle of TOW missile employment that says "use standoff." This principle, which is typically perceived to mean "engage at maximum range," is applied to other weapons as well. It requires another look.

In an article in INFANTRY's January-February 1989 issue ("Weapon Position-

ing: The Circular Technique," pages 11-14), Lieutenant Colonel Pierce T. Graney and Dr. Robert H. Sulzen describe a shift in our defensive doctrine away from the concept of engaging an enemy force at maximum range and briefly provide some good reasons for it.

I would like to expand upon some of the issues and employment considerations they raised, placing particular emphasis on the TOW but also addressing the Bradley's 25mm gun and the M60A3 and M1 tanks' 105mm main gun (or 120mm for the M1A1).

(While all the information in this article is unclassified, I encourage infantry and combined arms leaders with SECRET or higher clearances to read (S) Training Circular 90-16, Antiarmor Operations on an Integrated Battlefield (U), Coordinating Draft, dated June 1988. As a result of responses from the field and information developed since the draft was published, the manual is scheduled to be distributed in February 1990.)

When the basic TOW missile was brought into the inventory nearly 20 years ago (1970), its primary target was