



MUNCHKIN[®] COLLECTIBLE CARD GAME

Buzzkill

Drug Development and Side Effects for *GURPS Fourth Edition*

by Matt Riggsby

Between the rule-of-thumb guidelines for ultra-tech drugs (p. B425) and the rules on new inventions (p. B473), it's quite possible for characters in science-fiction settings (cyberpunkish settings are particularly appropriate) to develop their own miracle drugs. And super-drugs needn't be limited to high-tech settings; consider the injection that produced the Invisible Man, the potion that turned Dr. Jekyll into Mr. Hyde, the super-serum that created Captain America, and the Miraclo pill that gives Hourman his powers. Better living through gadgeteering!

But in the rules given, bugs for near-miss successes are fairly vague and relatively easily fixed, whereas in real drug development, few if any drugs are free of side effects and interactions that might be regarded as bugs. Just about every medication comes with a list of warnings about who should not take it (pregnant or nursing women, people taking MAO inhibitors, people with allergies to penicillin, etc.) and possible side effects (headaches, nausea, etc.). Such problems are likely to persist into the future; even Captain Kirk had drug allergies. And since there are guidelines for inventing alchemical potions (p. M212), fantasy has its own kind of pharmaceutical research.

The tables below allow the GM to quickly come up with potential side effects to newly developed drugs, or to add color to existing drugs in high-tech campaigns. For each bug that the initial design creates, roll on the side effects table below, then apply limitations to those side effects as desired.

Side Effects

For each side effect, roll three dice and consult the table below. Read each die individually rather than totaling them; for example, a roll of 3-6-6 would mean a minor respiratory problem. Where no game effect is given, treat as the disadvantage of the same name.

Effects marked with a * are insignificant enough that they can be regarded as minor bugs; more serious effects may or may not be regarded as minor depending on other circumstances. Causing severe chest pains is a big problem if a drug has that effect on everyone who has it; if only 1% of people who take it get those pains, it's not such a problem.

Effects marked with a ! are *permanent*. They inflict a permanent, but possibly treatable, disadvantage on the subject.

Effects marked with a + are supernatural or metaphysical in nature. They're appropriate for alchemical and perhaps super-powered potions, but in high-tech campaigns, the GM may wish to reroll.

Roll	Description	Game Effect
1 to 3 1 1	Addictive	
1 to 3 1 2	Berserk	
1 to 3 1 3	Bestial +	
1 to 3 1 4	Blood thinning	Treat as Hemophilia
1 to 3 1 5	Blurred vision	Treat as Bad Sight; possibly correctable with eye drops
1 to 3 1 6	Carcinogen!	User acquires the Terminally Ill disadvantage. Both Prevalence and Habitual Use limitations should be applied automatically.
1 to 3 2 1	Chronic Depression	
1 to 3 2 2	Cursed +	
1 to 3 2 3	Disorientation	Treat as Confused
1 to 3 2 4	Disturbing Voice +	
1 to 3 2 5	Dizziness	-3 to DX and -1 to IQ
1 to 3 2 6	Dry mouth*	Treat as Gluttony, but limited to liquids
1 to 3 3 1	Extreme general soreness	Treat as Chronic Pain (Agonizing)

1 to 3	3	2	Fatigue *	Treat as Drowsy (p. B428)
1 to 3	3	3	Frightens Animals +	
1 to 3	3	4	General malaise: a combination of mild depression and physical discomfort resulting in an inability to enjoy anything.	Treat as Killjoy
1 to 3	3	5	General soreness	Treat as Chronic Pain (Mild)
1 to 3	3	6	Generalized mild discomfort *	Nausea, headache, itching. Distracting, but not critical. -1 to IQ for tasks requiring long- term concentration
1 to 3	4	1	Hair loss	Patchy hair loss reduces appearance by one level if the user isn't already bald. The effect is impermanent in that hair will grow back, but otherwise this effect is not subject to duration modifiers
1 to 3	4	2	Highly Addictive	
1 to 3	4	3	Hunger *	Treat as Gluttony
1 to 3	4	4	Impaired judgment	Treat as Impulsiveness
1 to 3	4	5	Indecisive	
1 to 3	4	6	Insomnia*	Treat as Insomniac; the effect lasts at least until the next time the character tries to sleep, regardless of its nominal duration.
1 to 3	5	1	Irritability*	Treat as Bad Temper
1 to 3	5	2	Lethal allergic reaction	Treat as a Heart Attack (p. B429),although the specific treatment needed will be different

1 to 3	5	3	Long-term organ damage !	Subject gains a level of Short Life Span
1 to 3	5	4	Loss of appetite *	
1 to 3	5	5	Lunacy +	
1 to 3	5	6	Magic Susceptibility +	
1 to 3	6	1	Manic-depressive	
1 to 3	6	2	Mildly impaired hearing (ringing in ears or other ear problems) *	-2 to Hearing rolls
1 to 3	6	3	Mildly impaired scent/taste *	-2 to Scent and Taste rolls
1 to 3	6	4	Mildly impaired touch (for example, numbness and tingling in extremities) *	-2 to Touch rolls
1 to 3	6	5	Mildly impaired vision (for example, mild blurring or extreme dryness)	-2 to Vision rolls
1 to 3	6	6	Minor respiratory problem *	Coughing, sneezing, or runny nose. 2 per minute for attempts to remain inaudible.
4 to 6	1	1	Minor systemic damage	The user suffers generalized damage to internal systems, taking 1d3 damage. This effect is impermanent in that it maybe healed normally, but is otherwise not subject to duration modifiers

4 to 6	1	2	Motion sickness *	
4 to 6	1	3	Neurological disorder (Crippling)	
4 to 6	1	4	Neurological disorder (Mild)	
4 to 6	1	5	Neurological disorder (Severe)	
4 to 6	1	6	Night blindness *	Triple darkness penalties
4 to 6	2	1	Nightmares	Like insomnia, this will apply at least the next time the character tries to sleep, regardless of nominal duration.
4 to 6	2	2	Numb	
4 to 6	2	3	Obsession+	
4 to 6	2	4	Organ damage !	Subject loses 1d3 HT permanently.
4 to 6	2	5	Panic	Subject suffers panic reactions; any moderately stressful situation requires a Fright Check
4 to 6	2	6	Paranoia	
4 to 6	3	1	Phantom Voices +	
4 to 6	3	2	Rebound	Subject suffers an "opposite" effect once the drug wears off. For example, a DX-increasing drug temporarily inflicts DX loss, a night-vision-inducing drug inflicts night blindness.
4 to 6	3	3	Seizures	Treat as Epilepsy

4 to 6	3	4	Sensitive digestion *	Treat as Restricted Diet for at least one day, regardless of nominal duration.
4 to 6	3	5	Sensitivity to light *	-2 to Vision and to-hit rolls in light which poses a penalty of 2 or less.
4 to 6	3	6	Sensitivity to pain	Overall tenderness or generalized pain increasing sensitivity to further pain. Treat as Low Pain Threshold.
4 to 6	4	1	Severe general soreness	Treat as Chronic Pain (Severe)
4 to 6	4	2	Severe nausea	Treat as Nauseated (p. 428)
4 to 6	4	3	Sexual side effects *	Subject temporarily loses interest in sex or ability to perform. Treat as Eunuch, although capability to reproduce has not necessarily been lost.
4 to 6	4	4	Short Attention Span	
4 to 6	4	5	Sleep disturbances *	Light sleeper
4 to 6	4	6	Sleepwalker+	
4 to 6	5	1	Slow Healing *	
4 to 6	5	2	Small muscular tremors	Treat as Ham-fisted
4 to 6	5	3	Sterility	Subject cannot reproduce
4 to 6	5	4	Supernatural Feature +	
4 to 6	5	5	Suppressed immune system	The subject is more susceptible to infections. 2 to HT to resist disease for at least 1d3 days regardless of nominal duration.
4 to 6	5	6	Tolerance: the	Roll 3d6 to determine a tolerance modifier.

			user gradually builds up a resistance to the drug	Every time the drug is taken, roll against HT + the tolerance modifier - total cumulative number of doses taken. If the HT roll fails, subsequent doses of the drug will have no effect on the user. Duration and habitual use modifiers do not apply to this effect.
4 to 6	6	1	Totally Addictive	
4 to 6	6	2	Treatable damage: Subject is afflicted with a permanent but treatable disorder (for example, diabetes or hypothyroidism).	Treat as a monthly Dependency on medication required to treat the disorder. Realistically, the character will probably take small, daily doses of a drug rather than one monthly dose; not taking it for a long term will start to cause damage.
4 to 6	6	3	Uncertain effect	The user must <i>fail</i> a HT roll for the drug to take effect. Do not roll duration modifiers
4 to 6	6	4	Unluckiness+	
4 to 6	6	5	Visible effect	Dilated or closed pupils, peculiar skin coloration, profuse sweating, speech impediment (slurring, stuttering). 1 to reaction modifiers
4 to 6	6	6	Weirdness Magnet +	

Modifiers

What makes side effects hard to fix is how long it takes them to appear. If the high-tech drug providing improved night vision, which you're formulating for the military, causes splitting headaches every time it is used, you can spot that quickly in testing and go back to the drawing board. However, it's quite possibly the case that those headaches will only develop in a few susceptible individuals, only after prolonged use, or only when taken together with the KombatQuik drug that someone else is developing.

For each side effect, roll a die. If the first die rolled in the side effects table above is a 2 or a 4, roll an additional die. If the first roll is a 3 or a 6, roll two additional dice. Again, each die is read

But I'm Allergic to Bat's Wings!

When it comes to inventing alchemical elixirs, the GM may be excused for bypassing the side effects table and coming up with picturesque effects appropriate to the potion's effect. For example, an animal

separately. Apply the corresponding modifiers, ignoring duplicates. For example, for that 3-4-2 roll in the first example, the GM would roll three dice (one, plus two more for rolling a 3 on the initial side effect die roll). If they came up 3-3-5, the GM would apply a prevalence modifier; the second 3 is ignored and the 5 indicates no modifier.

control potion might cause the user to grow whiskers and a cold, wet nose, while a potion protecting the user from fire might cause him to grow icicles hanging from his nose, ears, and chin.

- 1 Interaction
- 2 Prevalence
- 3 Duration
- 4 Habitual use
- 5-6 None

Interaction

If a side effect has an interaction modifier, the effect only manifests when the drug is taken within a day of another drug or chemical. The GM will have to select the drug with which it interacts as appropriate to the campaign, but 1d6 can be used to determine how common that drug is:

1-**Very common:** Inexpensive, easily obtained, and frequently used chemicals such as aspirin, 3 caffeine, alcohol.

4-**Common:** Somewhat more expensive but still fairly frequently used drugs, such as 5 antidepressants, penicillin, prescription pain killers, birth control medication, advantage or attribute-granting drugs costing \$500 or less

6 **Rare:** Most drugs to treat specific conditions (for example, glaucoma or cancer), advantage or attribute-granting drugs costing \$500 and up

Prevalence

Many side effects happen to some people but not to others. Roll two dice to see how common the side effect is.

Roll Prevalence (approximate) Prevalence roll

1-2 1-2 1 in 2

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1-2	3-4	1 in 4	13
1-2	5-6	1 in 10	15
3-4	1-2	1 in 20	16
3-4	3-4	1 in 50	17
3-4	5-6	1 in 100	17/11
5-6	1-2	1 in 200	18
5-6	3-4	1 in 1000	18/14
5-6	5-6	1 in 10,000	18/17

The first time a character takes a drug where the side effect has a prevalence modifier, the user should attempt to roll under the number indicated in the prevalence roll column. If there are two numbers, roll against the second one if the first roll fails. If the character fails the roll, the side effect will manifest every time he takes the drug. (Note that HT scores don't enter into it. If you have a reaction to a drug, it's more likely a consequence of your body chemistry than your overall health.)

Duration

Typically, a side effect last as long as the drug itself (+/- 10%, at the GM's discretion). However, it may be a short-term effect, or it may persist even longer. Roll 3d6.

3-5 One quarter as long

6-9 Half as long

10-11 2× duration

12-13 3× duration

14-15 4× duration

16 8× duration

17 10× duration

18 Permanent

Habitual use

Some side effects only manifest after prolonged use. Roll 3d6-3 to obtain a modifier. Every time the drug is taken, roll against HT + the modifier total cumulative number of doses taken in the past (drug's duration * 100). Once the user fails the HT roll, he will suffer the side effect with every dose of the drug unless he stops taking it for the drug's duration * 100.

Other Considerations

One possible objection to applying the invention rules to drug development is that the development times involved are orders of magnitude too short. Development cycles for new drugs is measured in years and decades, not days and weeks. Certainly, the state of the art at TL9 may be far, far beyond what it is now, but the GM may still feel uncomfortable letting PCs come up with infallible cancer cures and super-strength pills in their kitchens. Therefore, some guidelines might be applied:

Remember that the table associating finished product costs on p. B473 is a *suggestion*, not a comprehensive rule. Any new drug might be regarded as at least a Complex invention, regardless of the finished cost, and require a minimum skill level of 18+.

Required times could easily be increased by very large amounts. For example, days might be treated as weeks, weeks as months, and months as years, with appropriate adjustments to related costs.

The chemical operations that ultra-tech drugs try to perform may be so complex that someone, somewhere will have an adverse side effect. The GM may rule that, even on a critical success on the design roll, 1d3 minor bugs exist, and at least one major bug on any non-critical success.

The less common the side effect, the harder it will be to find. If a testing attempt indicates that a bug has been found, pick the undiscovered side effect with the fewest modifiers. In order to actually discover the bug, make the following rolls:

- **Interaction:** Roll a 10 or less on 3d6 for an interaction with a Very Common drug, an 8 or less for a Common drug, or a 6 or less for a Rare drug.
- **Prevalence:** Make the same rolls as necessary to fall subject to the effect, but at +1 to each roll for each round of testing the drug has been through previously to a maximum of +5. For example, if a side effect effects 1 in 200 people, it would be detected on an 18 on the first round of testing, 17 or 18 on the second round, 16+ on the third, and so on until it would be detected on a 13+ on the sixth and each subsequent round of testing.
- **Habitual Use:** Roll greater than the habitual use modifier.

If a side effect has multiple modifiers, *all* of the rolls must be made. Consequently, it would take a lot of testing to turn up a side effect afflicting 2% of users after extended use in conjunction with aspirin or heavy drinking. Indeed, a drug could be tested for a very, very long time without finding all of the potential side effects. And even if they were found, going back to the drawing board to fix all of a drug's side effects may be a very expensive and time-consuming proposition.

But that doesn't have to be a show-stopper for characters who want to become pharmaceutical manufacturers. As already observed, any number of drugs widely available today have well-known side effects: antihistamines make you drowsy, allergies to aspirin and penicillin are not uncommon, and so on. They're not perfect, but they do their jobs well enough that they're used anyway. Any major bug is likely to keep a drug off the open market in a well-controlled society, but it might still

circulate on the black market, or at least be sold with multiple warning labels about the potential dangers and be used only in extremity. Even significant minor bugs might keep a drug from being commercially viable. In a more chaotic or ruthlessly competitive setting, though, such as most cyberpunk campaigns, it'd be quite easy for powerful drugs with dangerous side effects to reach the open market.

Article publication date: March 4, 2005

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