



BRETT C. STOFFEL

# “Survival 101”

**N**o one plans to have an accident. What you *can* plan for is how to survive an aviation emergency if you find yourself in that predicament.

## Formula for Survival

While it is not magic, there is a formula that can help you focus on what you really need to stay alive after an emergency:

$$\text{PMA} + 98.6 = \text{BCS}$$

Positive Mental Attitude (PMA) plus 98.6 (the normal core-body temperature in Fahrenheit) equals the Best Chance for Survival (BCS). This simple formula captures a key idea: The proper attitude and the right focus on physiology give us the best chance at making it through a tough ordeal.

Let's start with PMA, or the psychology of survival. Peter Kummerfeldt, founder of OutdoorSafe, defines survival as “the ability and the desire to stay alive, all alone, under adverse conditions until rescued.” Although Kummerfeldt's definition includes some of the physiological aspects, each has a psychological component. “Ability” implies skills that a prepared person has taken the time to learn. The survivor has total control over the “desire to stay alive.” The combination of

desire to stay alive and learned abilities contributes to the individual's capacity to endure, if necessary, “all alone” and “under adverse conditions until rescued.”

An important part of PMA is the ability to channel fear into a useful direction. Uncontrolled fear can short-circuit rational behavior. But fear can also sharpen senses and prepare the body for “fight or flight.” To use the natural fear reaction for good, think STOP: Stop what you are doing; Think about what causes your fear; Observe your surroundings objectively; and make a Plan to avoid danger.

Now, let's address what it takes to survive physically. In *The Essentials of Sea Survival*, Frank Golden, M.D., Ph.D., and Mike Tipton, Ph.D., stress the importance of understanding the body's needs as well as maintaining a thermal, hydration, and energy balance. The top priority is air, or more accurately, oxygen. High altitudes present a common reason for lack of oxygen. Smoke and fumes from a fire, or a water-filled cockpit after

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**As Federal Air Surgeon Frederick E. Tilton, M.D., discusses in this issue's Aeromedical Advisory column, FAA videos on survival training, aerospace physiology, and human factors are at: [www.faa.gov/pilots/training/airman\\_education/](http://www.faa.gov/pilots/training/airman_education/).**

ditching also present oxygen-critical situations.

Next in line is shelter, which is vital in protecting you from wind, cold temperatures, rain, sun, or cold water immersion. Clothing provides the first line of defense for shelter, followed by resources carried with you (including the remains of the aircraft), and anything in the environment. Since it is nearly impossible to improvise a windproof and waterproof shelter of purely natural materials, it's advisable to carry an immediate-action, full-body shelter.

Once you have taken care of air and shelter needs, you need to rest and conserve your energy resources. While resting, the body processes wastes, converts stored fats into energy, and allows the brain to recover some of its mental freshness.

Water and food complete the remaining two priorities. The amount of water required depends on conditions and activity, and can vary from 3 quarts a day in typical urban consumption to as much as several gallons in extremely hot and arid environments.

With respect to food, most of us could survive months without consuming any calories. The energy expended, and risks involved, in most food-gathering activities far outweigh any benefit gained. Consuming strange foods may even reduce chances for survival, since gastrointestinal illnesses can rapidly diminish the body's stored

food and water resources.

## Be Prepared

It is a good idea to stock a survival kit that can help you meet the body's basic requirements in an emergency. The survival kit should cover six basic categories: shelter, fire, signaling, medical, water disinfection/storage, and tools.

You might also consider basic survival training. Good courses include information on first aid, finding water, building shelter, making a fire, and improvising signal devices. Practice these skills at home or under controlled conditions. It also helps to maintain physical fitness.

Surviving an aircraft accident is rarely due to luck. By staying positive and properly prioritizing what the human body needs to survive, you will give yourself a much better chance to have stories to tell about survival in the wild.

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