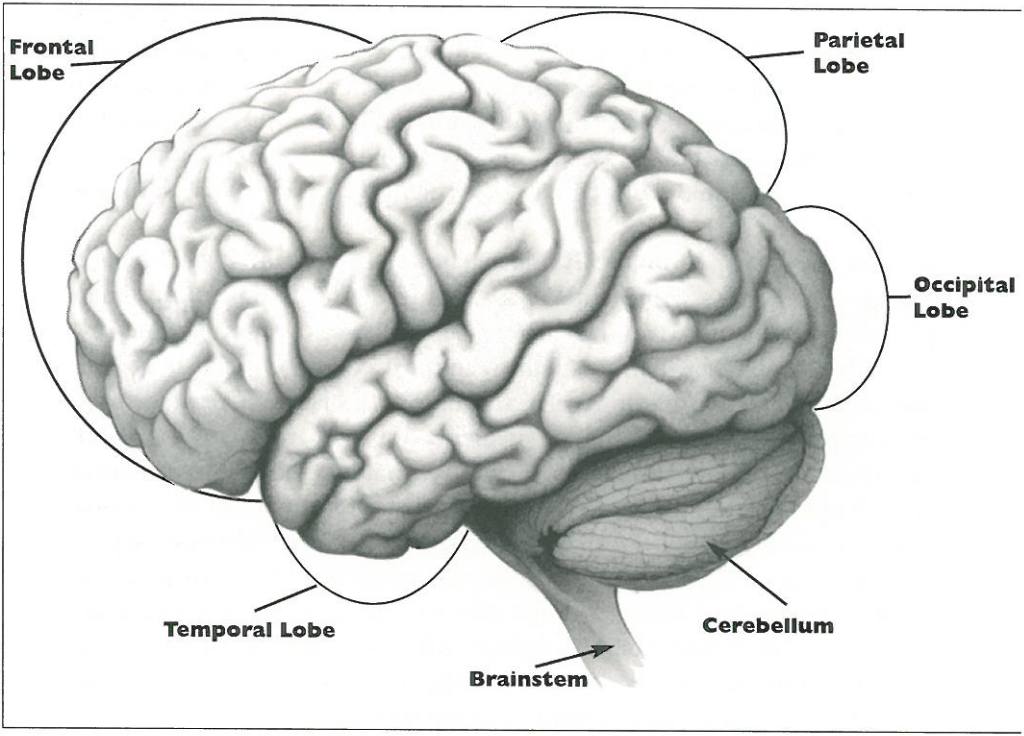

Figure 1: The Modern Human Brain

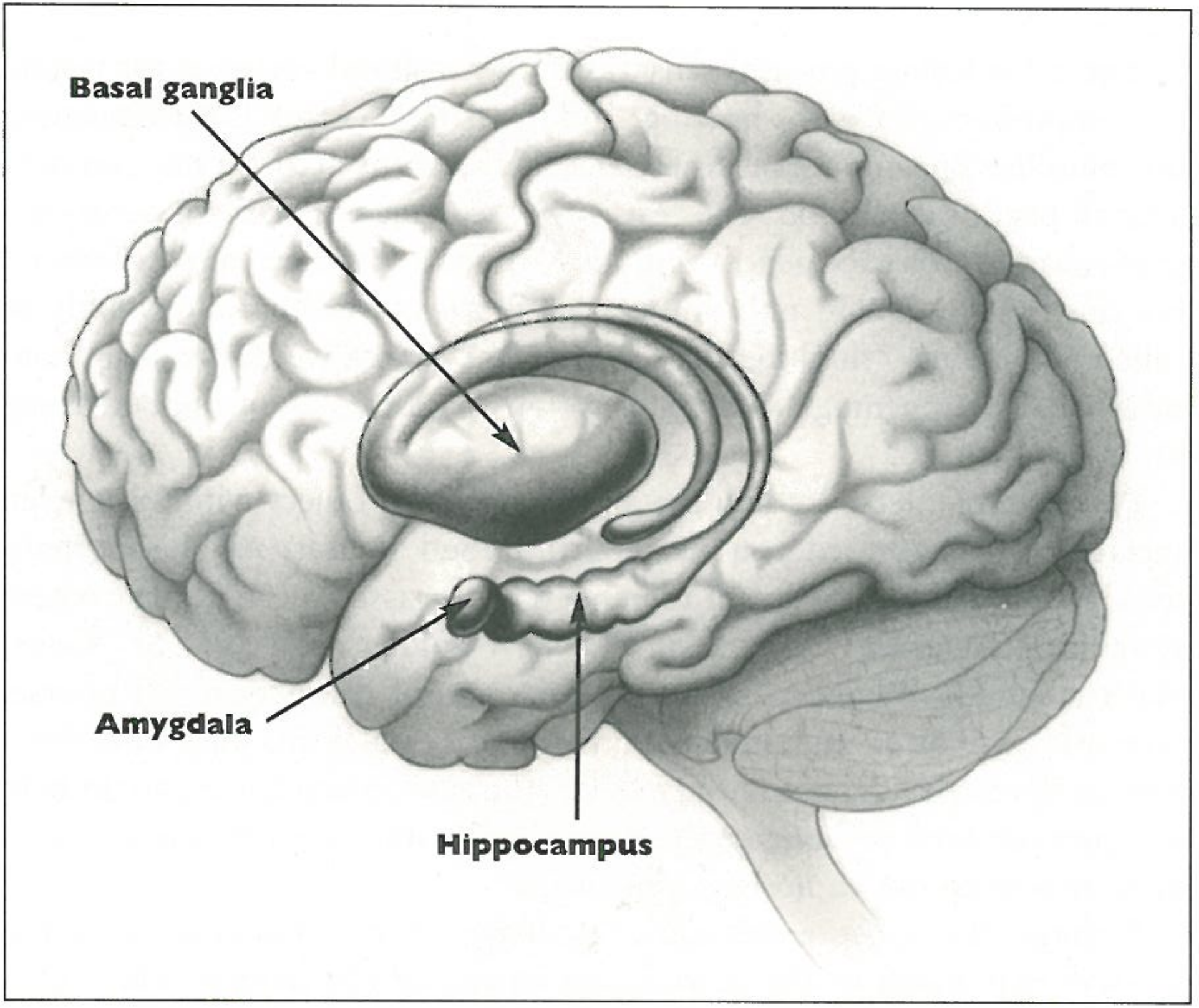

Figure 2: A See-Through Picture of the Brain, Showing the Deep Neuron Clusters

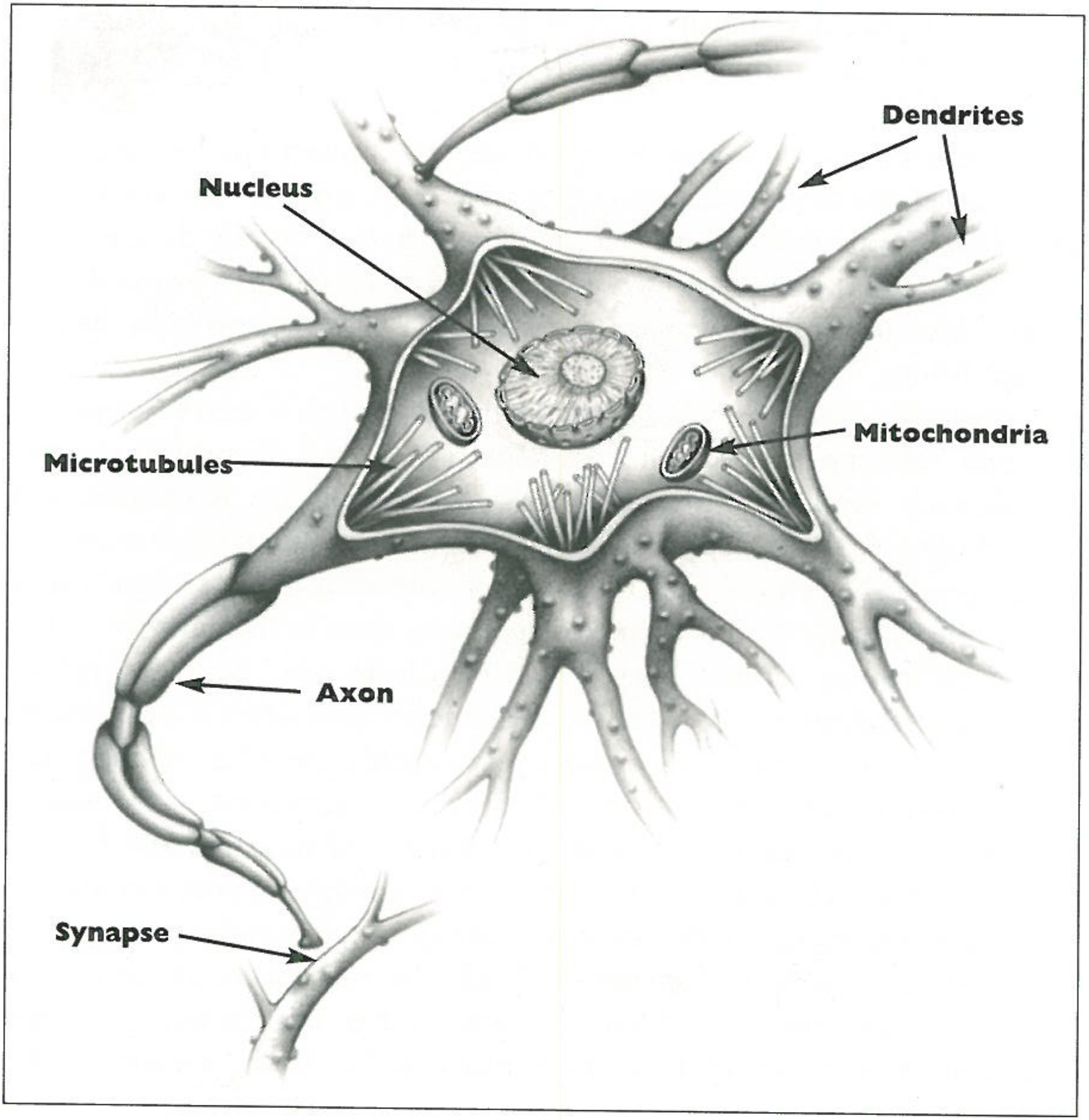

Figure 3: A Neuron

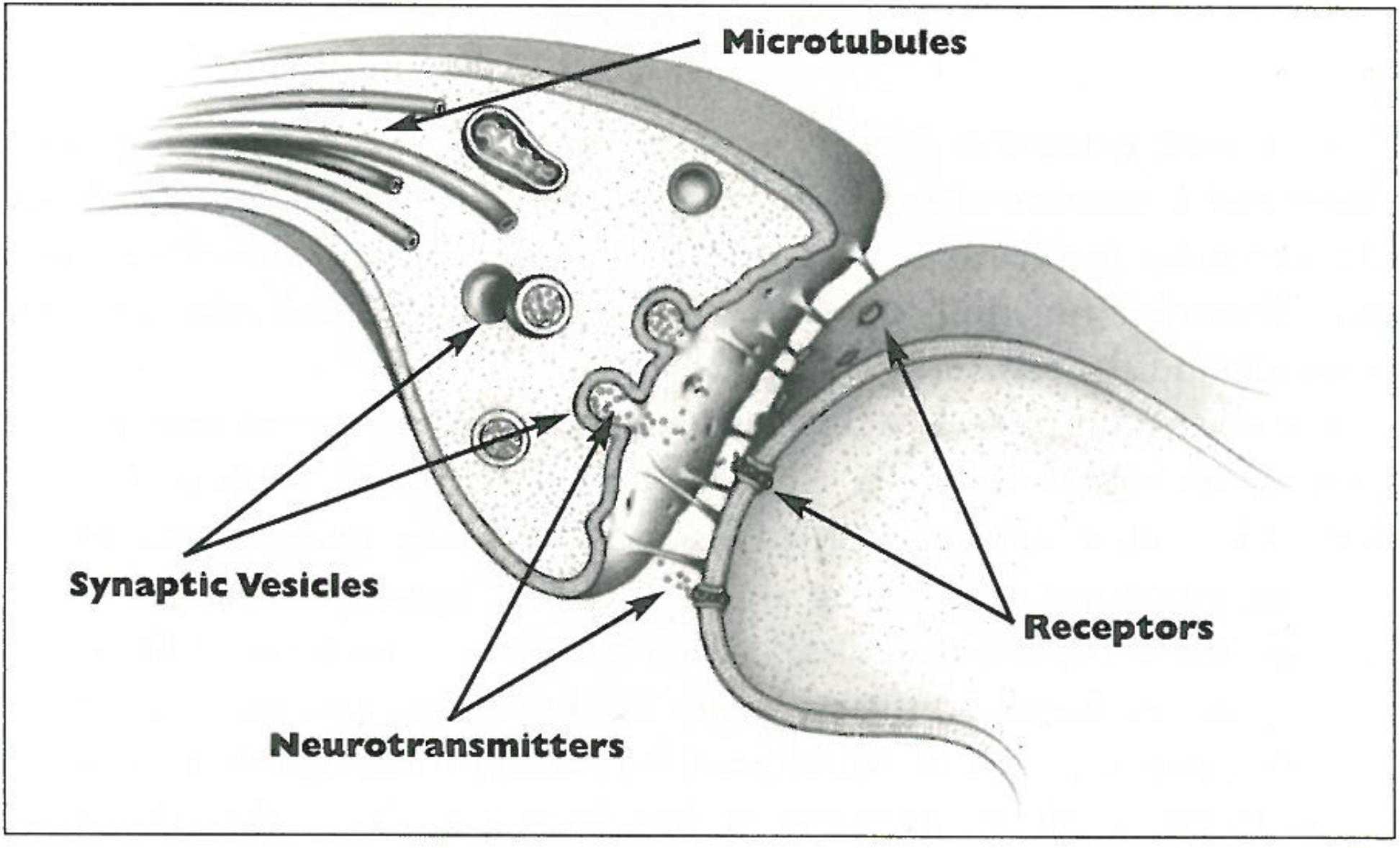

Figure 4: A Synapse

How More or Less Stimulating Experiences Relate to the Stress Response and the Strength of Emotional Memory

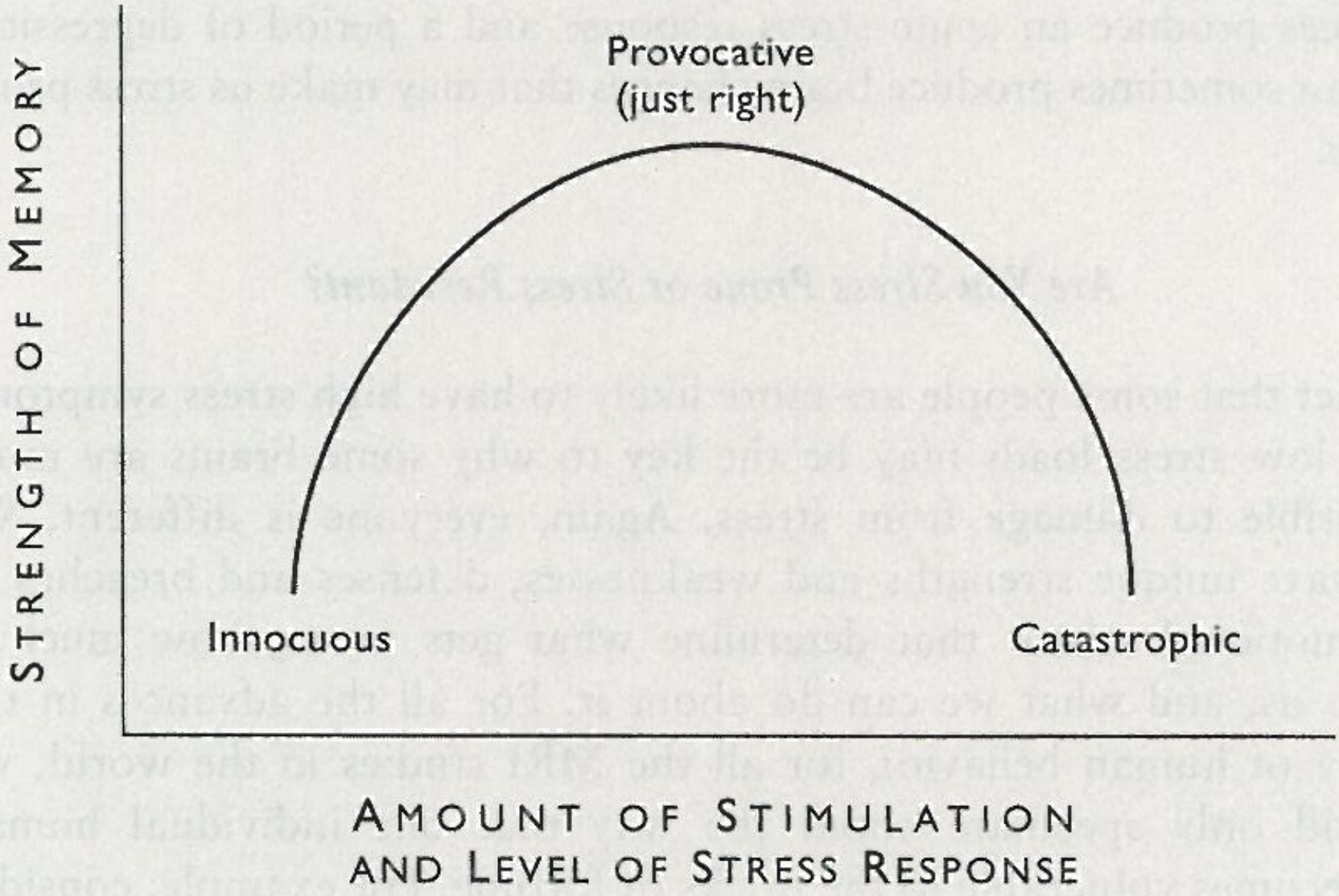

Table 1

Nervous System Toxins and Toxicants

Naturally Occurring Neurotoxins (Partial List)

TUBOCURARINE	Also called *curare*, a toxin from the plant *Chondodendron tomentosum*; blocks motor neurons and causes paralysis; is used as an arrow poison, and to achieve immobility in general anesthesia
BOTULINUM TOXIN	A toxin made by the microorganism *Clostridium botulinum;* found in improperly canned food; affects the nerve-muscle junction, causing severe weakness and death in most cases; is used clinically to reduce muscle spasms and even reduce facial lines
TETRODOTOXIN	A toxin absorbed via consumption of improperly prepared puffer fish, called *fugu* in Japan; blocks motor and sensory nerve impulses, causing respiratory paralysis and death in most cases
PFIESTERIA PISCIDIA	A microorganism found in fish off the East Coast; has caused memory loss among fishermen in Chesapeake Bay.

Human-Made Neurotoxicants (Partial List)

PESTICIDES	Many types; exposure is common in farming, spraying of fruit trees, houseplants, pests like ants, bees, and roaches; these agents often overexcite the cholinergic system, producing neuropathies, weakness, and mental status changes
NERVE GASES	Many types; the most common work just like pesticides, overexciting the cholinergic system, often to the point of death
SOLVENTS	Many types are used in different industries with different clinical effects, including: **ALIPHATIC HYDROCARBONS:** gasoline, kerosene, propane, butane, pentane, hexane, heptane, and octane **ALIPHATIC HALOGENATED HYDROCARBONS:** chloroform, carbon tetrachloride, methylene chloride, methyl chloride, trichloroethylene, tetrachlorethylene, vinyl chloride

continued on next page

ALCOHOLS: methanol, isopropyl alcohol
GLYCOLS: ethylene glycol
AROMATIC HYDROCARBONS: benzene, toluene, polycyclic aromatic hydrocarbons (PAHs)

METALS

ARSENIC	Used in copper smelting and semiconductor manufacture; found in some herbal remedies; interferes with oxidative metabolism; causes muscle spasms, seizures, agitation, memory loss
LEAD	Used in battery production, foundries; jewelry production; found in old painted surfaces; interferes with many enzymes; causes fatigue, headaches, anxiety, memory loss
MANGANESE	Used in battery production, fertilizers, gasoline additives; causes free radical damage, especially to cells in the substantia nigra and basal ganglia; causes a parkinsonian disorder
MERCURY	Used in the production of chlorine, paints, paper; also found in thermometers; inhibits many enzymes and harms membrane function; causes emotional instability, memory loss, spasticity
THALLIUM	Used in rat and ant poisoning, infrared detectors, and photocells; causes numbness, weakness, respiratory paralysis, emotional instability, and delirium
ZINC	Used in many manufacturing processes; affects excitatory transmission; causes irritability; contributes to excitatory neurotoxicity

Table 2

High-Stress Jobs

Soldier in battle
Disaster relief worker (especially those who recover bodies)
Military trainee in basic training
Public schoolteacher
Astronaut
Nurse (especially in intensive care, cancer, burn, HIV, and some pediatric wards)
Air traffic controller
Professional working with the mentally disabled, mentally ill, or victims of head trauma
Sex worker (male or female prostitute)
Short-haul bus or taxi driver
Social worker
Airline pilot
Deep-sea fisherman
Hard-hat diver
Factory worker doing a monotonous, rapid, repetitive task
Farmer on a small farm
Policeman or policewoman
Firefighter
Emergency medical technician
Attorney (especially a new associate in a law firm)
Physician (especially one in training, or transitioning to managed care)
Flight attendant (especially on long-haul routes)

Body Mass Index Chart

Height (Feet and Inches)

Weight (Pounds)	5'0"	5'1"	5'2"	5'3"	5'4"	5'5"	5'6"	5'7"	5'8"	5'9"	5'10"	5'11"	6'0"	6'1"	6'2"	6'3"	6'4"
100	20	19	18	18	17	17	16	16	15	15	14	14	14	13	13	12	12
105	21	20	19	19	18	17	17	16	16	16	15	15	14	14	13	13	13
110	21	21	20	19	19	18	18	17	17	16	16	15	15	15	14	14	13
115	22	22	21	20	20	19	19	18	17	17	17	16	16	15	15	14	14
120	23	23	22	21	21	20	19	19	18	18	17	17	16	16	15	15	15
125	24	24	23	22	21	21	20	20	19	18	18	17	17	16	16	16	15
130	25	25	24	23	22	22	21	20	20	19	19	18	18	17	17	16	16
135	26	26	25	24	23	22	22	21	21	20	19	19	18	18	17	17	16
140	27	26	26	25	24	23	23	22	21	21	20	20	19	18	18	17	17
145	28	27	27	26	25	24	23	23	22	21	21	20	20	19	19	18	18
150	29	28	27	27	26	25	24	23	23	22	22	21	20	20	19	19	18
155	30	29	28	27	27	26	25	24	24	23	22	22	21	20	20	19	19
160	31	30	29	28	27	27	26	25	24	24	23	22	22	21	21	20	19
165	32	31	30	29	28	27	27	26	25	24	24	23	22	22	21	21	20
170	33	32	31	30	29	28	27	27	26	25	24	24	23	22	22	21	21
175	34	33	32	31	30	29	28	27	27	26	25	24	24	23	22	22	21
180	35	34	33	32	31	30	29	28	27	27	26	25	24	24	23	22	22
185	36	35	34	33	32	31	30	29	28	27	27	26	25	24	24	23	23
190	37	36	35	34	33	32	31	30	29	28	27	26	26	25	24	24	23
195	38	37	36	35	33	32	31	31	30	29	28	27	26	26	25	24	24
200	39	38	37	35	34	33	32	31	30	30	29	28	27	26	26	25	24
205	40	39	37	36	35	34	33	32	31	30	29	29	28	27	26	26	25
210	41	40	38	37	36	35	34	33	32	31	30	29	28	28	27	26	26
215	42	41	39	38	37	36	35	34	33	32	31	30	29	28	28	27	26
220	43	42	40	39	38	37	36	34	33	32	32	31	30	29	28	27	27
225	44	43	41	40	39	37	36	35	34	33	32	31	31	30	29	28	27
230	45	43	42	41	39	38	37	36	35	34	33	32	31	30	30	29	28
235	46	44	43	42	40	39	38	37	36	35	34	33	32	31	30	29	29
240	47	45	44	43	41	40	39	38	36	35	34	33	33	32	31	30	29
245	48	46	45	43	42	41	40	38	37	36	35	34	33	32	31	31	30
250	49	47	46	44	43	42	40	39	38	37	36	35	34	33	32	31	30

Underweight | Weight Appropriate | Overweight | Obese

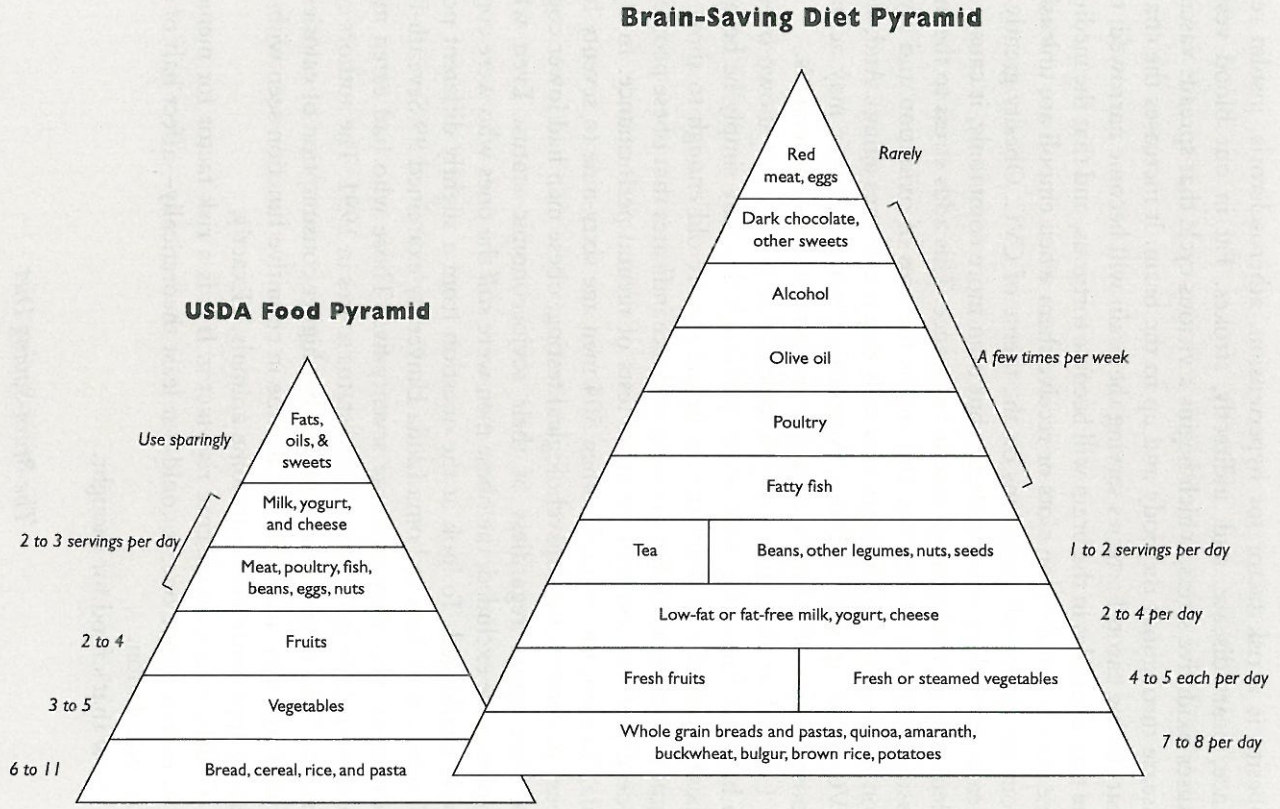
Brain-Saving Diet Pyramid
Red meat, eggs
Rarely
Dark chocolate, other sweets
Alcohol
Olive oil
A few times per week
Poultry
Fatty fish
Tea
Beans, other legumes, nuts, seeds
1 to 2 servings per day
Low-fat or fat-free milk, yogurt, cheese
2 to 4 per day
Fresh fruits
Fresh or steamed vegetables
4 to 5 each per day
Whole grain breads and pastas, quinoa, amaranth, buckwheat, bulgur, brown rice, potatoes
7 to 8 per day
USDA Food Pyramid
Use sparingly
Fats, oils, & sweets
2 to 3 servings per day
Milk, yogurt, and cheese
Meat, poultry, fish, beans, eggs, nuts
2 to 4
Fruits
3 to 5
Vegetables
6 to 11
Bread, cereal, rice, and pasta

Table 3

Botanicals for the Brain

A PARTIAL LIST OF BOTANICALS PROPOSED TO HAVE ANTI-AGING OR BRAIN-AIDING POWERS

Acidophilus
Aconitum alkaloids (Chinese)
Aloe
Alpiniae fructus (Asian)
Astragalus
Beta-eudesmol (Chinese)
Catechins
Celastrus paniculatus
Club moss (Chinese; source of huperzine)
Cnidium rhizome (Asian)
Codyceps
Coriaria lactone (Chinese)
Dan Shen (radix *Salviae miltiorrhizae*) (Chinese)
Deer antler velvet
Dihydroergocristine
Dong quai (Chinese)
DX-9386 (Chinese formulation)
Ehmannia root (Asian)
Evening primrose (*Oenothera biennis*)
Foti
Galanthamine
Garlic
Genistein
Ginkgo biloba
Ginseng
Green tea
Guarana (*Paulinia cupana*)
Hachimijiogan (Asian formulation)
Hoasca (ayahuasca) (Amazonian)
Huperzine A and B (from club moss)
Japanese angelica root
Kamikihi-To (Chinese)
Kava (*Piper methysticum*) (Polynesian)
Lignans
Ligusticum chuanxiong (Chinese)
Ligusticum wallichii (Chinese)
Lycopene
Maharishi Amrit Kalash (Indian/Ayurvedic)
Mentat (BR-16A) (Indian/Ayurvedic)
Myricetin (in ginkgo)
Nao Li Shen (Chinese formulation)
Peony root (paeoniflorin and tetramethylpyrazine)
Phytic acid
Propolis
Psyllium
Quercetin (in ginkgo)
Qingyangshen (Chinese)
Raubasine
Rutin
S-adenosylmethionine (SAMe)
Schizandra
Shilajit (Indian/Ayurvedic)
Shimotsu-to (Chinese formulation)
Sho-saiko-to-go-keishi-ka-shakuyaku-to (TJ-960) (Japanese formulation)
Soybeans
St. John's wort
Sulforaphane
Toosendanin (Chinese)
Trasina (Indian/Ayurvedic)
Turmeric
Wine
Yizhiling granule (Chinese)

A COMPLETE LIST OF BOTANICALS PROVEN TO HAVE THOSE POWERS

The Most Common Causes of Head Injury

1. VEHICULAR ACCIDENTS

- Automobile
- Motorcycle
- Bicycle
- Snowmobile
- Motor boat/personal watercraft

2. NONVEHICULAR INCIDENTS

- Trip-and-falls and other domestic accidents
- Domestic assaults and abuse
- Fights
- Gunshot wounds

3. SPORTS AND RECREATIONAL ACTIVITIES

- Football
- Baseball
- Skiing
- Skateboarding
- Roller skates or in-line skates
- Soccer
- Hockey
- Rugby
- Boxing
- Sailing
- Equestrian sports
- Bull riding

Occupations with High Frequencies of Head Injury

Construction workers, especially heavy or highway
Loggers and sawyers
Miners
Carpenters
Electricians, including linemen
Mechanics and repairers
Plumbers and pipe fitters
Assemblers
Packers, wrappers
Welders
Laborers
Freight and stock handlers, warehouse laborers
Military personnel

Table 4
Head Injury Criterion (HIC) and Static Stability Factor (SSF) of Several Popular Motor Vehicles

MAKE	MODEL/YEAR*	WEIGHT (LBS.)	HIC DRIVER	HIC PASSENGER	SSF**
Acura	2001 3.2 TL 4-door with standard side air bag	3,493	547	541	
Audi	2001 A8 with standard side head and air bags	3,751	384	384	
Chevrolet	2001 Silverado Ext. cab 4x4 pickup	4,423	825	704	1.19
Chevrolet	2001 Suburban 4-door 4x4 with standard side air bag	5,699	659	467	1.08
Chrysler	2001 PT Cruiser, 4-door with optional side head and air bags	3,203	1080	467	1.26
Ford	Crown Victoria, 4-door	3,922	361	289	1.51
Ford	2001 Explorer with or without optional side head and air bags	4,258	567	558	1.06
Ford	2001 F-150 4x4 4-door pickup truck	4,650	439	571	1.12
Ford	2001 Taurus with or without optional side head bag	3,393	345	370	1.43
Ford	2001 Windstar with or without optional side head and air bags	4,231	256	516	1.26
Honda	2001 Accord 4 door with optional side air bag	3,078	258	414	1.45
Honda	2001 Odyssey minivan	4,244	309	379	1.32
Jeep	2001 Grand Cherokee 4-door 4x4	3,968	998	773	1.09
Lexus	2001 IS 300 4-door with standard side air bag	3,302	547	614	
Lexus	RX-300 4x4				1.21
Mercedes	1998 c230 4-door with side air bag	3,190	647	654	

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Activities and Metabolic Equivalents

ACTIVITY	METs	AEROBIC?
Sitting	1.0	No
Painting	3.0	No
Weeding	3.5	No
Walking	3.5	Yes
Brisk walking	4.5	Yes
Raking leaves	4.3	Yes
Golf	4.5	No
Calisthenics*	5.5 to 8.0	Yes
Snow shoveling	6.0	Yes
Weight lifting*	6.0 to 10.0	No
Tennis	5.5	Yes
Swimming laps**	6.0 to 12.0	Yes
Jogging**	6.0 to 10.0	Yes
Stair climbing	8.0	Yes
Running	13.0	Yes

* Calisthenics can be anaerobic if the heart rate is permitted to fall; weight lifting can be aerobic if the heart rate is kept elevated. The MET value of both varies with the particular exercise.

** The MET value of swimming and jogging both vary with speed and body mass index; the MET value of jogging also depends on terrain.

MAKE	MODEL/YEAR*	WEIGHT (LBS.)	HIC DRIVER	HIC PASSENGER	SSF**
Mercedes	2000 ML-320 with side air bag	4,396	510	227	1.13
Nissan	2001 Altima 4-door	3,054	585	429	
Toyota	2001 Corolla 4-door with or without optional side air bag	2,498	722	566	1.42
Toyota	2001 Camry 4-door with or without optional side air bag	3,175	525	428	1.45
Toyota	2001 Sienna minivan	3,973	468	395	1.25
Volvo	2000 S70 4-door with standard side air bag	3,126	259	294	
Volvo	2001 S80 4-door with standard side head and air bags	3,556	401	282	

* Unless otherwise noted, the vehicle was tested without side head or side air bags.

** SSF data available as of October 2001. New data are regularly added to the NHTSA website.