Ice Cream or Brain Freeze Headache

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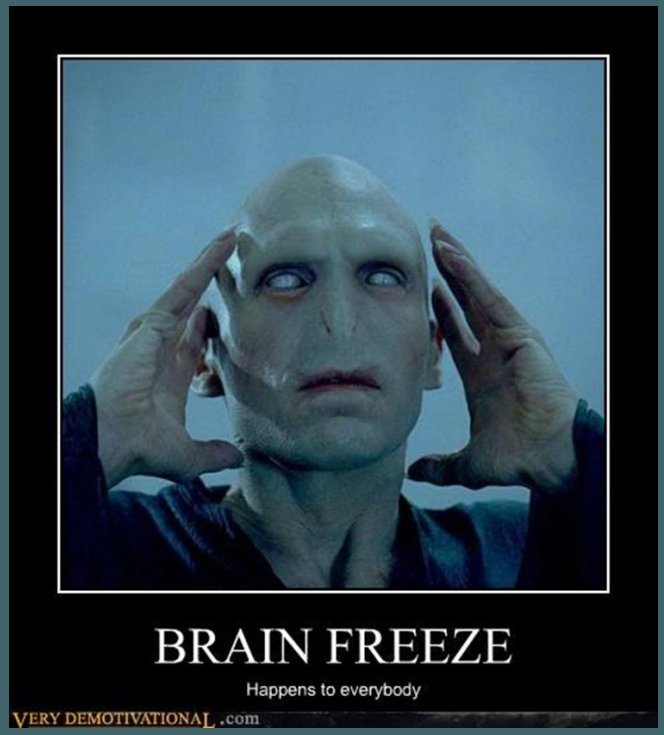
Ice Cream or Brain Freeze Headache

This has become a source of fun and amusement for the public



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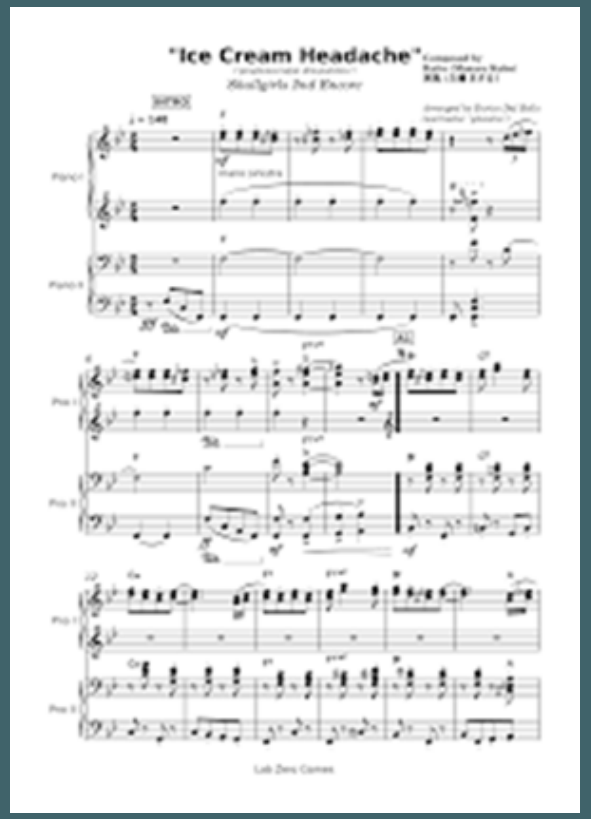
This one, I have waited for 45 years in practice to hear!

Made lyrical (though my pianist kid says it is rather dissonant)



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And just when you thought we were done with American Home Videos: We Get Cruelty to Animals!

More on this later

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History

According to The New Yorker, the first written account of a cold-stimulus headache comes from Patrick Brydone in the 1770s. Brydone described a British naval officer in Sicily who consumed a large bite of ice cream and spat it out "with a horrid oath".

The term ice-cream headache has been in use since at least January 31, 1937

The first published use of the term brain freeze, in the sense of a cold-stimulus headache, was in 1986

N.B. 7-Eleven has trademarked the term

Ice Cream or Brain Freeze Headache

Descriptors of Pain Characteristics and Duration

- 59% lasted for less than 10 seconds[1]

- Duration shorter than 30 sec in 92.7%.
- Pain was occipital in 17%.
- Trigemino-autonomic symptoms in 22%,
- Visual phenomena (e.g., flickering lights) in 18%[3]

1.Kaczorowski M, Kaczorowski J. BMJ 2002;325:1445-6

3. Kraya T, Schulz-Ehlbeck M, Burow P, Watzke S, Zierz S. Cephalalgia 2020 Mar;40(3):299-306

4. Mages S, Hensel O, Zierz AM, Kraya T, Zierz S. Cephalalgia 2017 Apr;37(5):464-469.

5. Bird N, MacGregor EA, Wilkinson MI. Headache 1992 Jan;32(1):35-8.

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Descriptors of Pain Characteristics and Duration

- Ice-water-provoked shorter latency (median 15 s)
- No difference in pain localization.
- Character after ice-cube stimulation: pressing
- After ice-water stimulation, as stabbing. Ice water had a higher pain intensity than ice cubes.
- Early onset (x = 12.5s) and short duration (x = 21s),
- Anterior headache on the same side as the palatal stimulus
- Bilateral headache following an ice cream swallow.

1.Kaczorowski M, Kaczorowski J. BMJ 2002;325:1445-6
3. Kraya T, Schulz-Ehlbeck M, Burow P, Watzke S, Zierz S. Cephalalgia 2020 Mar;40(3):299-306
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Descriptors of Pain Characteristics and Duration

- A significant minority experienced late onset (x = 102s) and long duration (x = 236s) occurring after swallowing ice cream, less well localized to the side of the cold stimulus.
- Not a common trigger for migraine
- No correlation between site of ice cream headache and usual site of migraine.

1.Kaczorowski M, Kaczorowski J. BMJ 2002;325:1445-6
3. Kraya T, Schulz-Ehlbeck M, Burow P, Watzke S, Zierz S. Cephalalgia 2020 Mar;40(3):299-306
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Epidemiology and Prevalence

Reported in about a third of a randomly selected population. It was further suggested that the ice cream headache could be induced only in hot weather.

8359 students completed the questionnaire.
The prevalence was 40.6%, higher in boys than in girls.
Students with migraine had a higher frequency of ice-cream headache compared with the students without migraine (55.2% vs. 39.6%, $P < 0.0001$).

2. Fuh J-L, Wang S-J, Lu S-R, Juang K-D. Cephalalgia. 2007 Mar;27(3):286

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Epidemiology and Prevalence

- 618 people aged 17-63 years, females: n = 426, 68.9%, prevalence of HICS was 51.3%
- Men 51.3% vs women 51.6%. headache attributed to ingestion or inhalation of a cold stimulus (HICS)

- The ice-water stimulus provoked HICS 38/77 vs the ice-cube stimulus 39/77).

- 27% of the migraine patients and 40% of the students reported ice cream headaches.
- 17% of the migraine patients and 46% of the students developed headache following palatal application or a swallow of ice cream.

2. Fuh J-L, Wang S-J, Lu S-R, Juang K-D. Cephalalgia. 2007 Mar;27(3):286

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Consumption Methodology

Eat 100 mL of ice cream in less than 30 seconds. 20/ of 73

Half their ice cream (50mL)was left after 30 seconds, and then they continued at their own pace. 9/72

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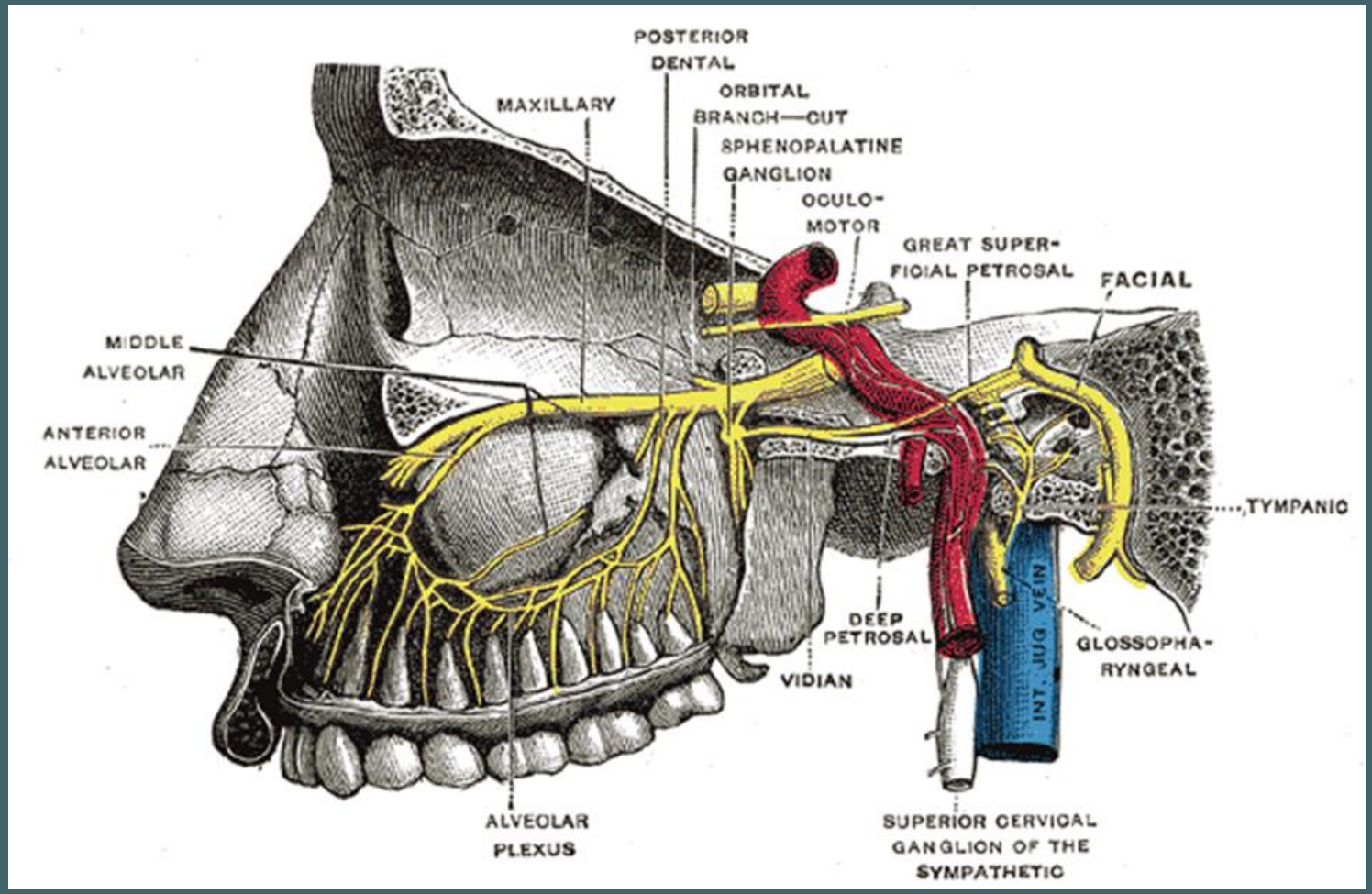

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FASEB Journal (April 2012 Issue), Critique of the study:

• Neither the Middle or Anterior Cerebral arteries supply branches to the hard or soft palate and likely not the posterior wall of the oral-Naso-pharynx

• Changes in blood flow in the Anterior Cerebral artery would occur as part of autoregulation of cerebral blood flow starting in the Internal Carotid artery.

• Ice water also resulted in greater cerebrovascular resistance during the experimentally induced "brain freeze"(i.e. the artery would undergo vasoconstriction during the brain freeze (constriction of arteries -less than what occurs in stroke does not induce pain.

•Vasodilation (after the cold stimulus is removed) would increase blood flow through the arteries of the palate and throat and through autoregulation in the middle and anterior cerebral arteries (though it is dubious that at that level of the blood vessels there are sensory fibers present)

•This study did not account for sensory nerve fibers in the oropharynx nor on the innervation of intracranial structure by branches of CN V. IX, and XII)

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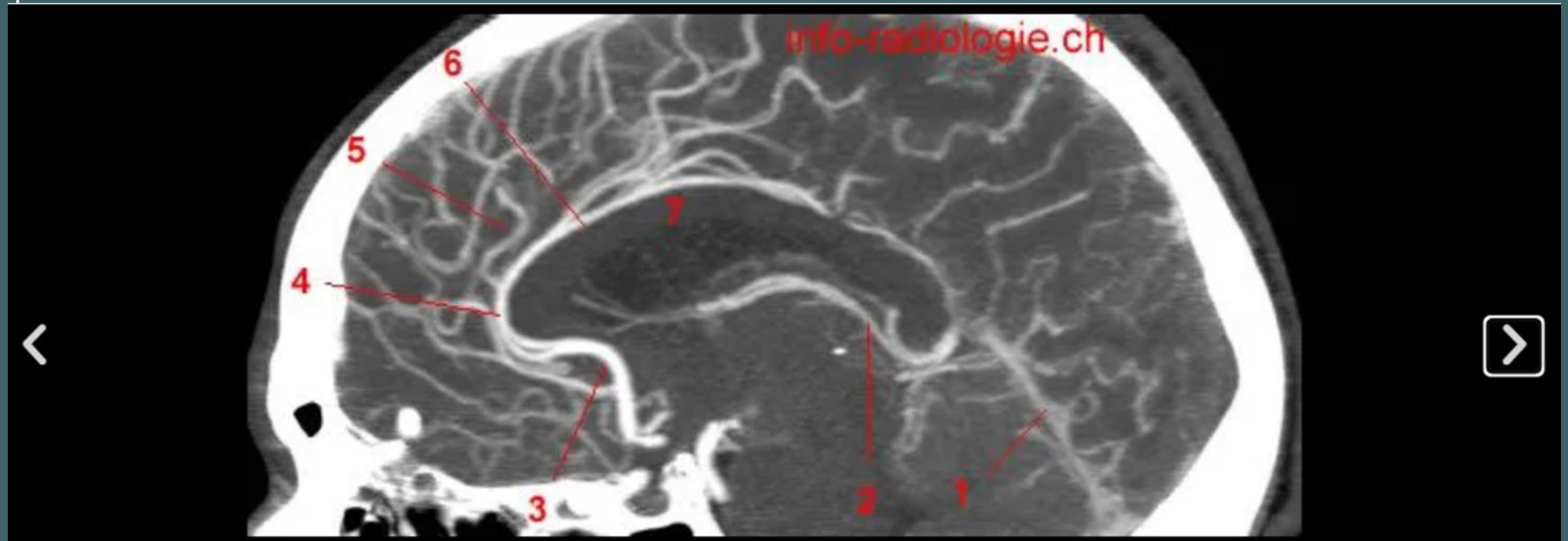

CT-scan of the brain, arterial phase, sagittal MIP sagittal (magnification). Image 3 of 3. 1, Straight sinus. 2, Internal cerebral vein. 3, Anterior cerebral artery (A2). 4, Anterior cerebral artery (A3). 5, Callosomarginal artery. 6, Pericallosal artery. 7, Corpus callosum.

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.• If your brain freeze lasts for more than 5 minutes, either with or without treatment, you may need to see your doctor.

• Seek help if it can also occur during a sudden exposure of the unprotected head to cold temperatures, such as by diving into cold water.

• A cold-stimulus headache is distinct from dentin hypersensitivity, a type of dental pain that can occur under similar circumstances.

• Cats and other animals have been observed exhibiting a similar reaction when presented with a similar stimulus.

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- Treating physicians may not identify cold ingestion as a causal factor of paroxysmal atrial fibrillation, thus compromising both history taking and patient education
- The rapid ingestion of ice-cold foods and beverages may precipitate episodes of paroxysmal atrial fibrillation.
- Healthy young-adult man who drank a slushed ice beverage that immediately induced atrial fibrillation and a brain freeze headache simultaneously. This occurred on two separate occasions, years apart. Acute brain freeze self-resolved quickly,
- New-onset palpitations required Emergency medical care.
- He took no medications and customarily ingested two cups of coffee every morning
- He reported several prior episodes of short, self-resolving palpitations.
- Once was found to be in AF, successfully cardioverted with 1 mg of intravenous ibutilide.
- BP 166/70 mmHg, HR 136 beats/min, oxygen saturation was 99%. Physical examination was normal.

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- Laboratory studies were all normal.
- Diltiazem 10 mg reduced his rapid ventricular response to less than 110 beats/min. cardioversion was pursued. ibutilide was chosen because it had been effective in the past.
- 56 minutes after the start of the first dose, the patient converted to a normal sinus rhythm with complete resolution of his symptoms.

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- The esophagus descends and abuts the left atrium and the vagal ganglia, implicated in the genesis of AF.
- This anatomic proximity allows esophagus to directly influence cardiac rhythms
- Ingestion of cold substances, neural pathways are triggered by receptors in the pharynx and esophagus that activate the cardioinhibitory center in the medulla.
- The medulla delivers a signal via the vagus nerve to the pulmonary vein region of the left atrium augmenting the ability of single atrial premature beats to initiate AF in susceptible individuals
- This vagally-mediated mechanism of cold-induced AF is thought to be more common in younger patients and those with structurally normal hearts

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- Difficult for us to know what a cat may be feeling.
- Assume they have a similar neuroanatomy to humans and that their sensory experience is similar to ours,
- When a cat gets something extremely cold, it is likely that they experience a similar pain to what a human would feel. The logical assumption is that 'brain freeze' in cats is similar to 'brain freeze' in people."
- Another theory is that the reaction could be due to the sensitive nerve endings in their teeth due to periodontal disease.

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One other cold-related headache:

- This is a headache related to cold exposure.
- Often bi-frontal
- Invariably triggered by external cooling of the head (contact with cold wind, exposure to air-conditioning or immersion of the head in cold water)
- Symptoms arise immediately upon exposure to the cold stimulus
- Resolve over 30–60 min following removal of the trigger
- Headache intensity increased proportionate to both time spent and magnitude of the cold environment.
- No change with activity.
- No associated nausea, vomiting, photophobia or cranial autonomic symptoms

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- Preventive regime of naproxen 750 mg taken 30 min prior to cold exposure.
- This reliable she would experience either no symptoms at all or only mild discomfort
  The underlying mechanism remains unknown
- Proposed to be vascular, where sudden exposure to cold may trigger rapid constriction of vessels thus activating vessel wall nociceptors.
- Alternative explanation may be pain from an ungated trigeminal afferent barrage trigeminocervical afferents have a cyclooxygenase component
- Role for the TRPM8 cold receptor, which is found in trigeminal neurons.

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With my apologies if you got brain freeze.

With my thanks for your attention!

Please feel free to contact me at Fred.Freitag @SSMHealth.com for any questions

And ON WISCONSIN!