

# Ketones: an essential brain fuel to support cognitive function during aging

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IS<sup>+</sup>M

FOOD FOR  
THE BRAIN





## Disclosures

Government funding

Private donations

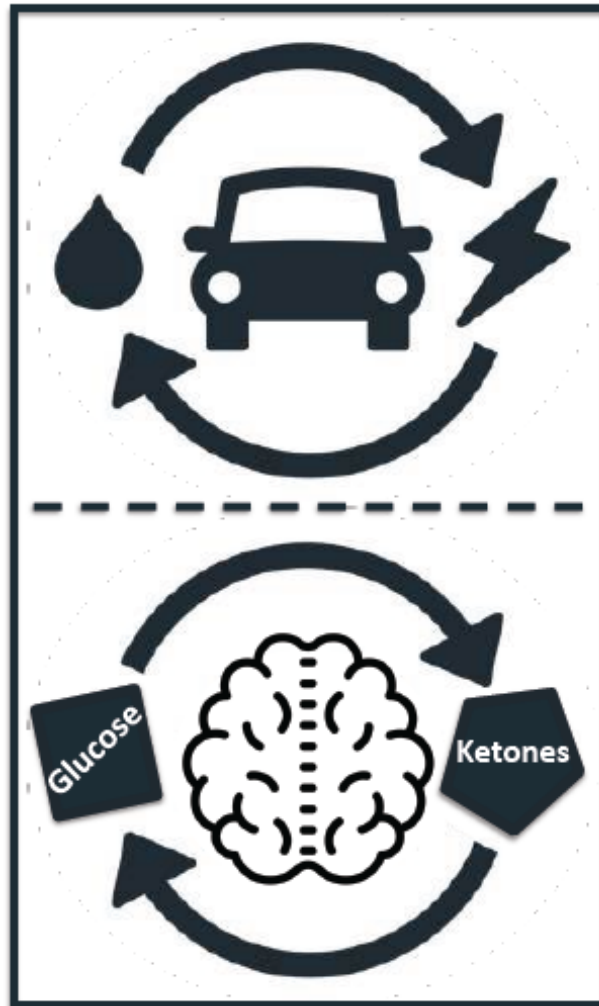
Corporations  
(Nestlé Health Science, Cerecin)







## The brain – a hybrid car

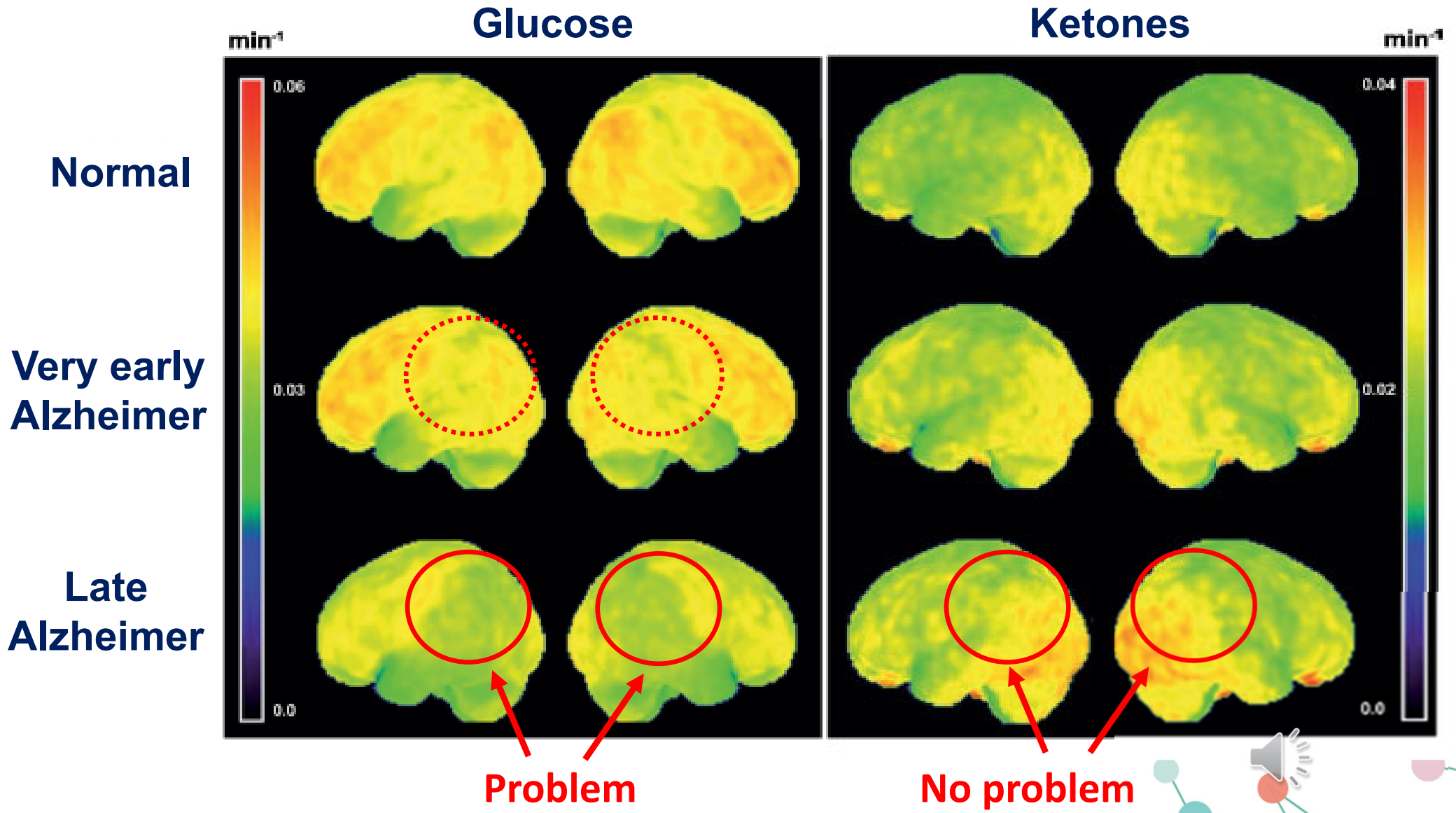


**GLUCOSE**  
(a form of sugar)  
(90 - 95%)

**KETONES**  
(derived from fats)  
(5 - 10%)



# Problem with getting petrol (glucose) into the engine but no problem with the battery or electric motor (ketones)



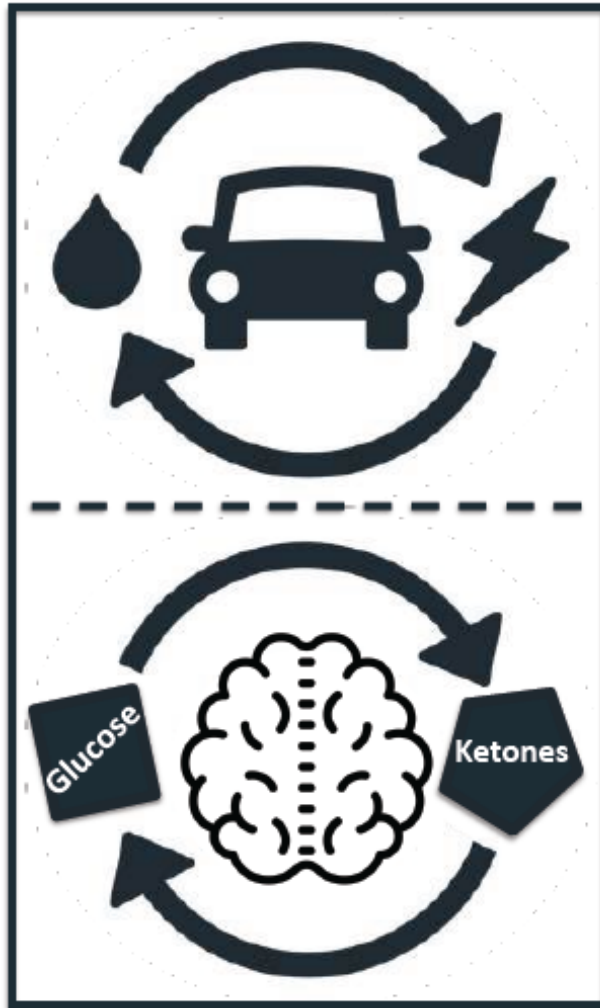


# Cognitive decline during aging: the hybrid car in difficulty

**Glucose**

(decline from  
90-95% to 70-85%)

**Decline of  
15-30% in  
Alzheimer  
and  
Parkinson  
Disease,**



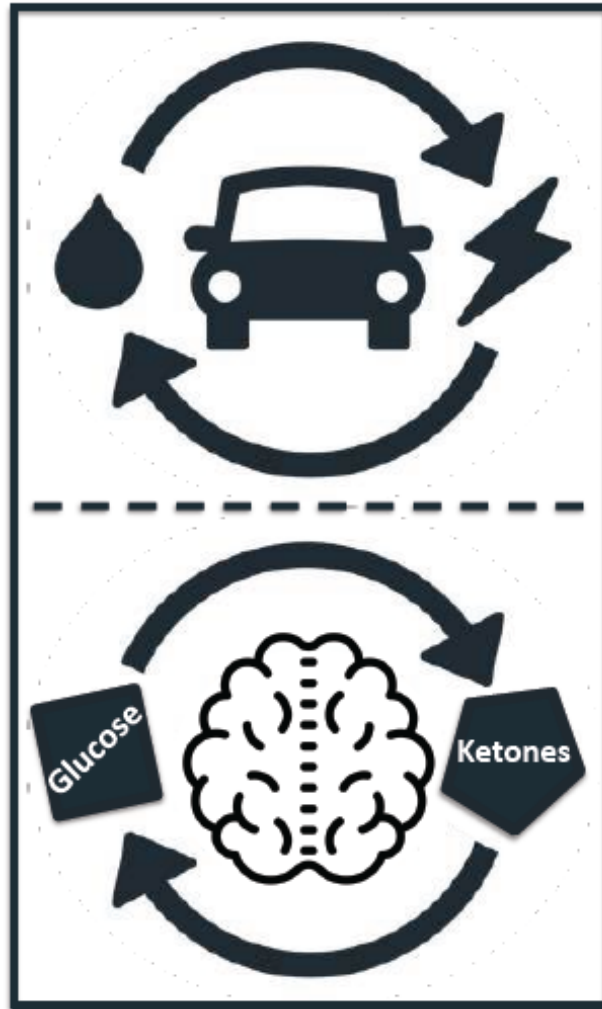
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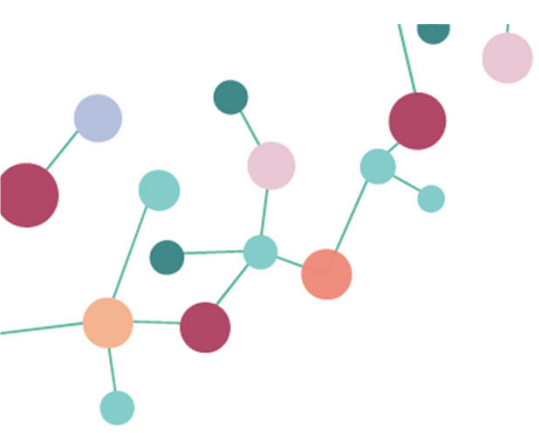
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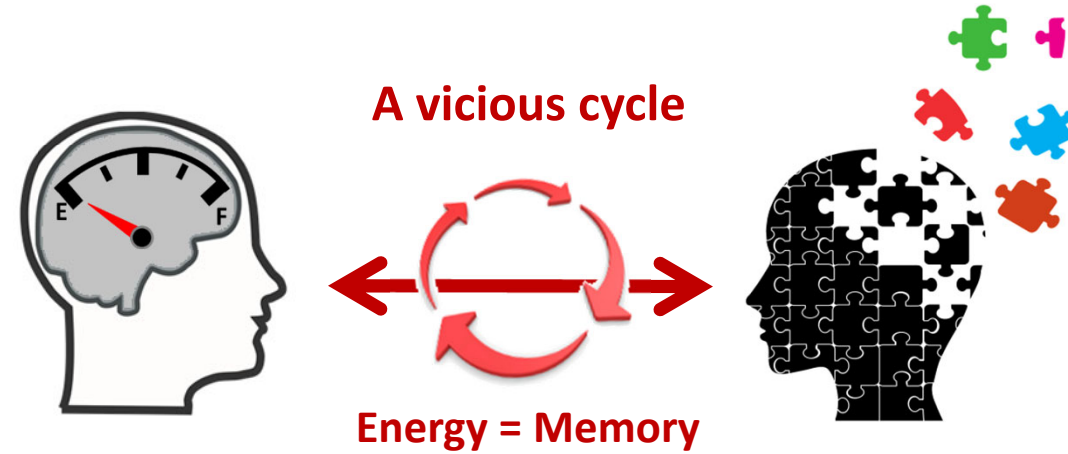
**No problem  
in Alzheimer  
Disease ... but  
no increase to  
compensate  
for lower  
glucose  
uptake either**



**(BRAIN ENERGY GAP)**



# Why is sufficient glucose not getting into the brain?



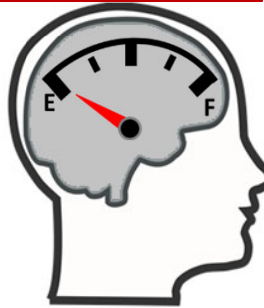
# Why is sufficient glucose not getting into the brain?

One of the main problems – SUGAR

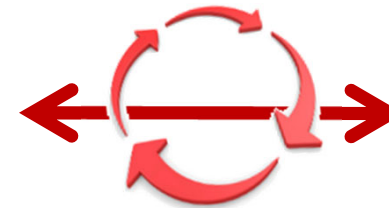
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*Too much =*  
*Not enough !*

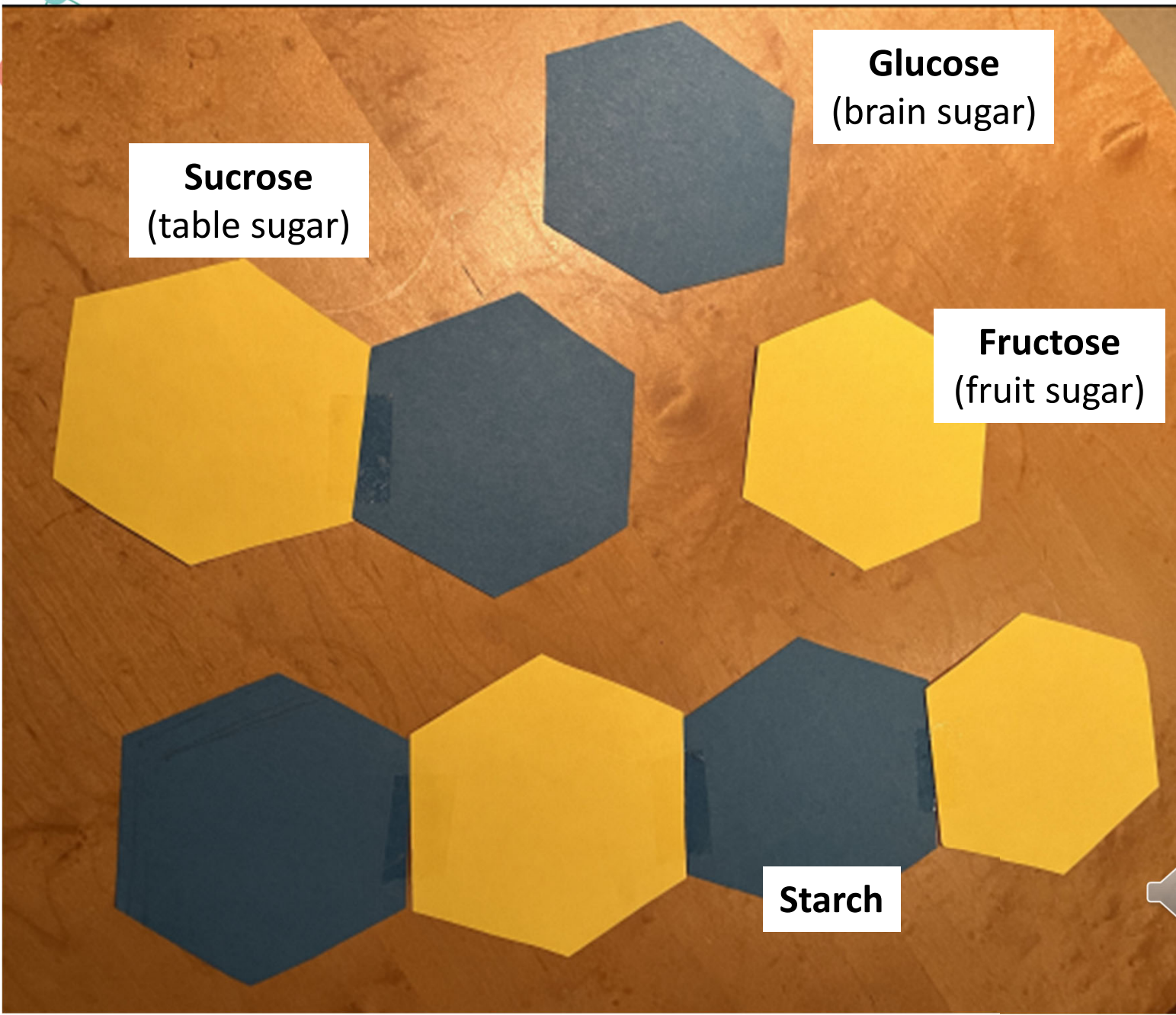
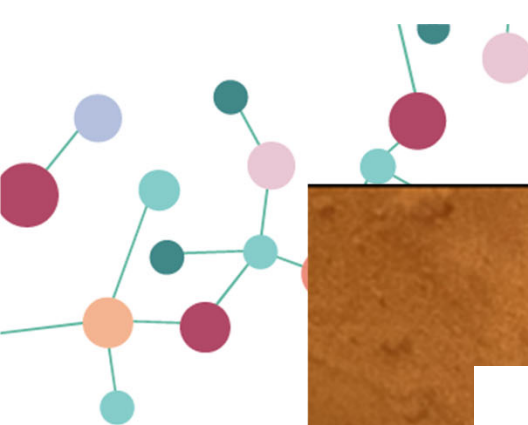


A vicious cycle



Energy = Memory







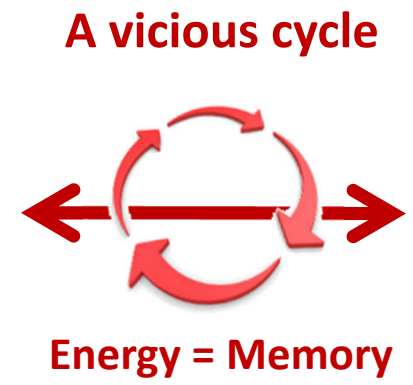
# Strategies to fuel and protect the brain

One of the main problems – SUGAR

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EMERGING SOLUTIONS



# Strategies to fuel and protect the brain

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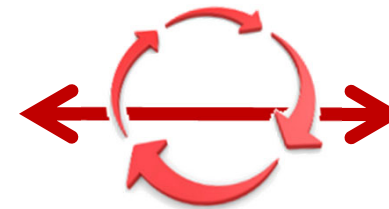
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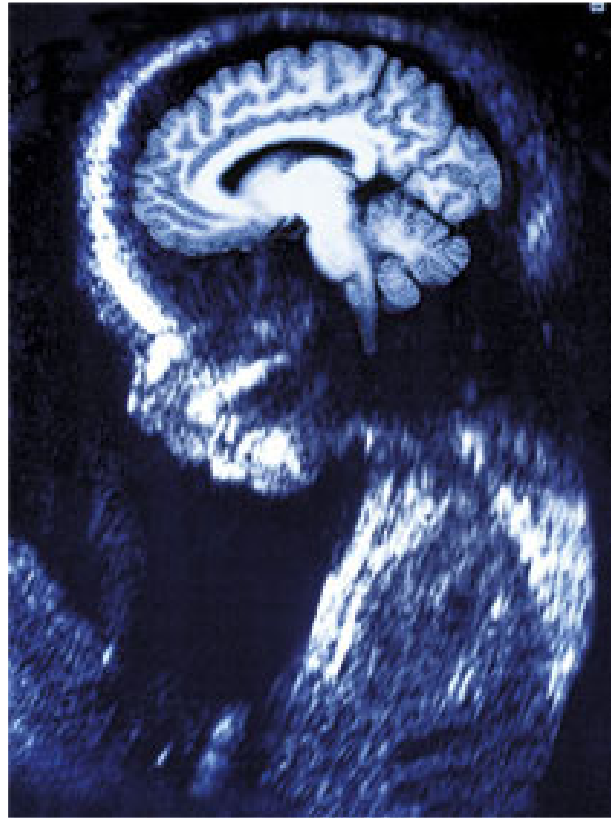
EMERGING SOLUTIONS

① KETONES  
Alternative fuel





## Ketones and the brain: Learning from the infant



Ketones from medium chain triglycerides  
(acronym MCT) in mother's milk





**LONG chain triglyceride**  
seed oils, animal fats (16-18 carbons)

**MEDIUM chain triglyceride (MCT)**  
(8 and 10 carbons;  
derived from coconut oil)

**Ketones**  
(4 carbons)

# Strategies to fuel and protect the brain

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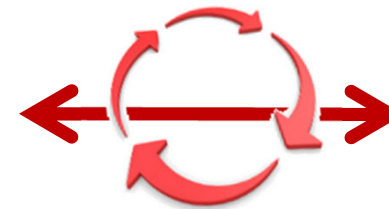
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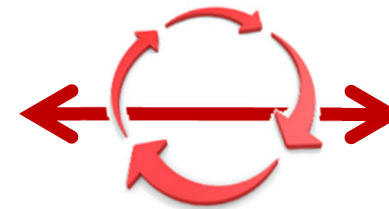
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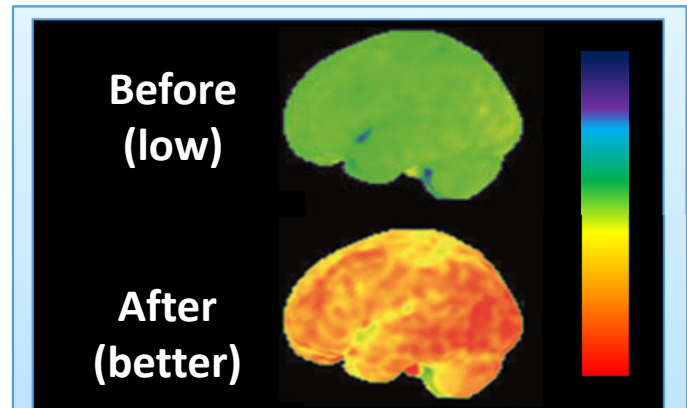


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## EMERGING SOLUTIONS



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- ❖ ↑ brain energy.
- ❖ ↑ cognitive performance in relation to brain ketone uptake.

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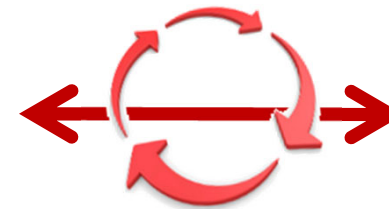
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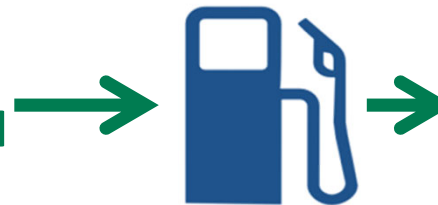
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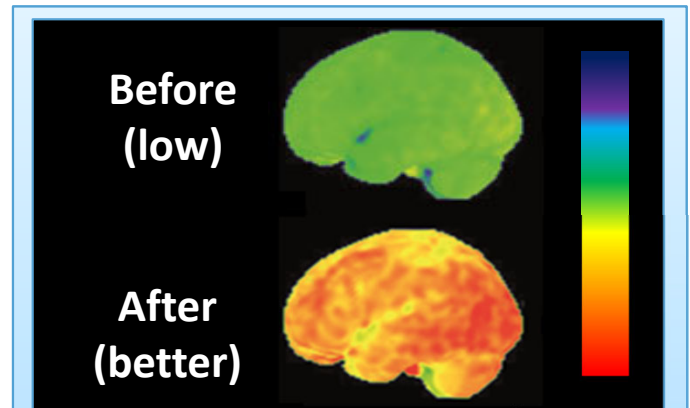


MCT- medium chain triglyceride oil

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② EXERCISE +  
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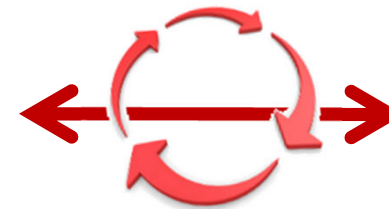
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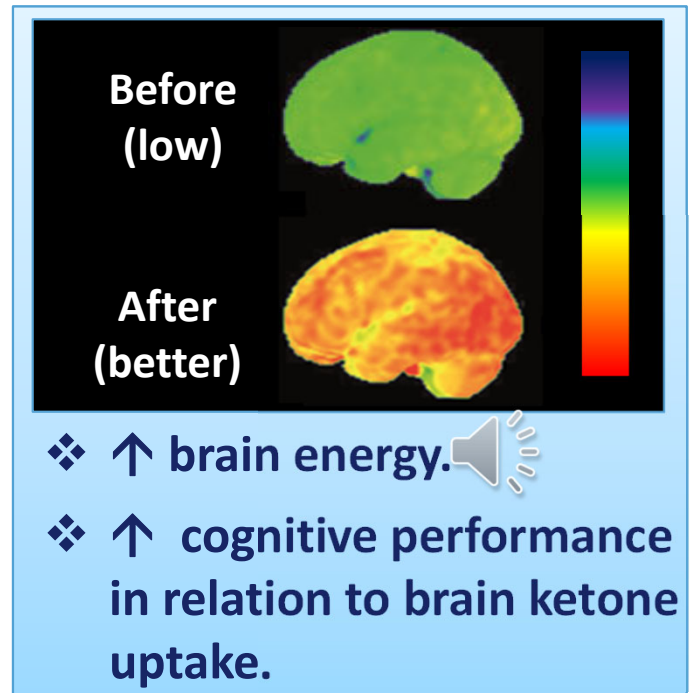


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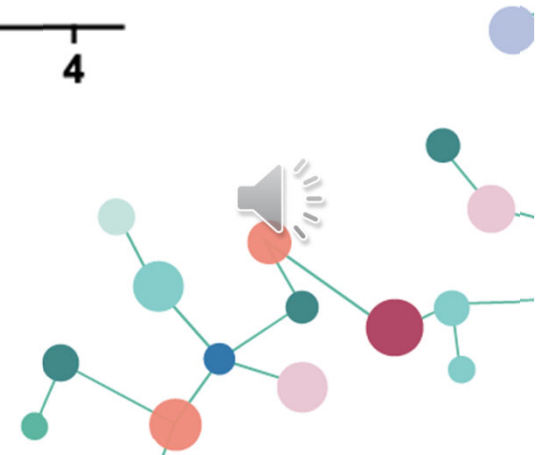
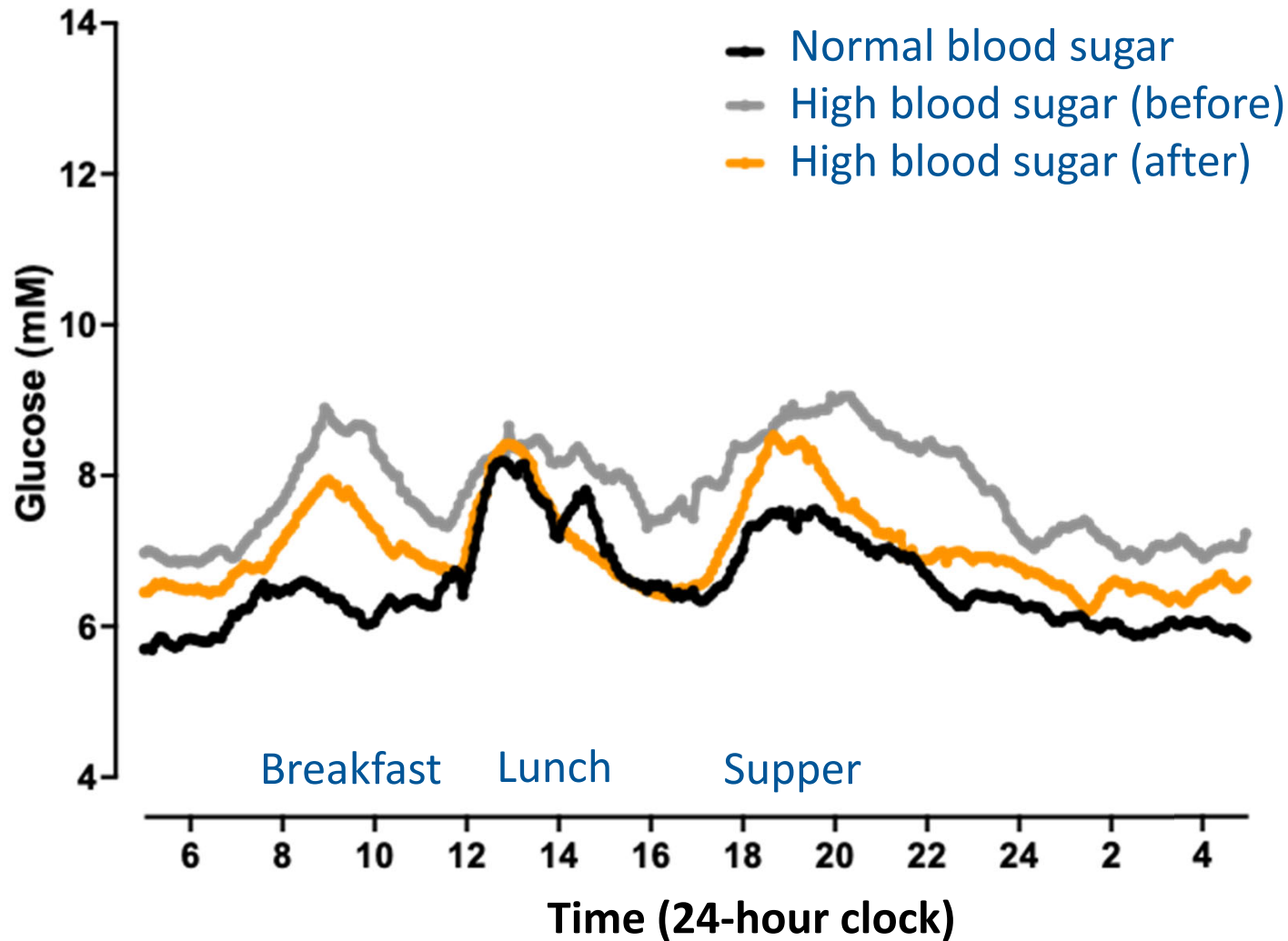
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③ DECREASE DIETARY SUGAR, ADD KETONES

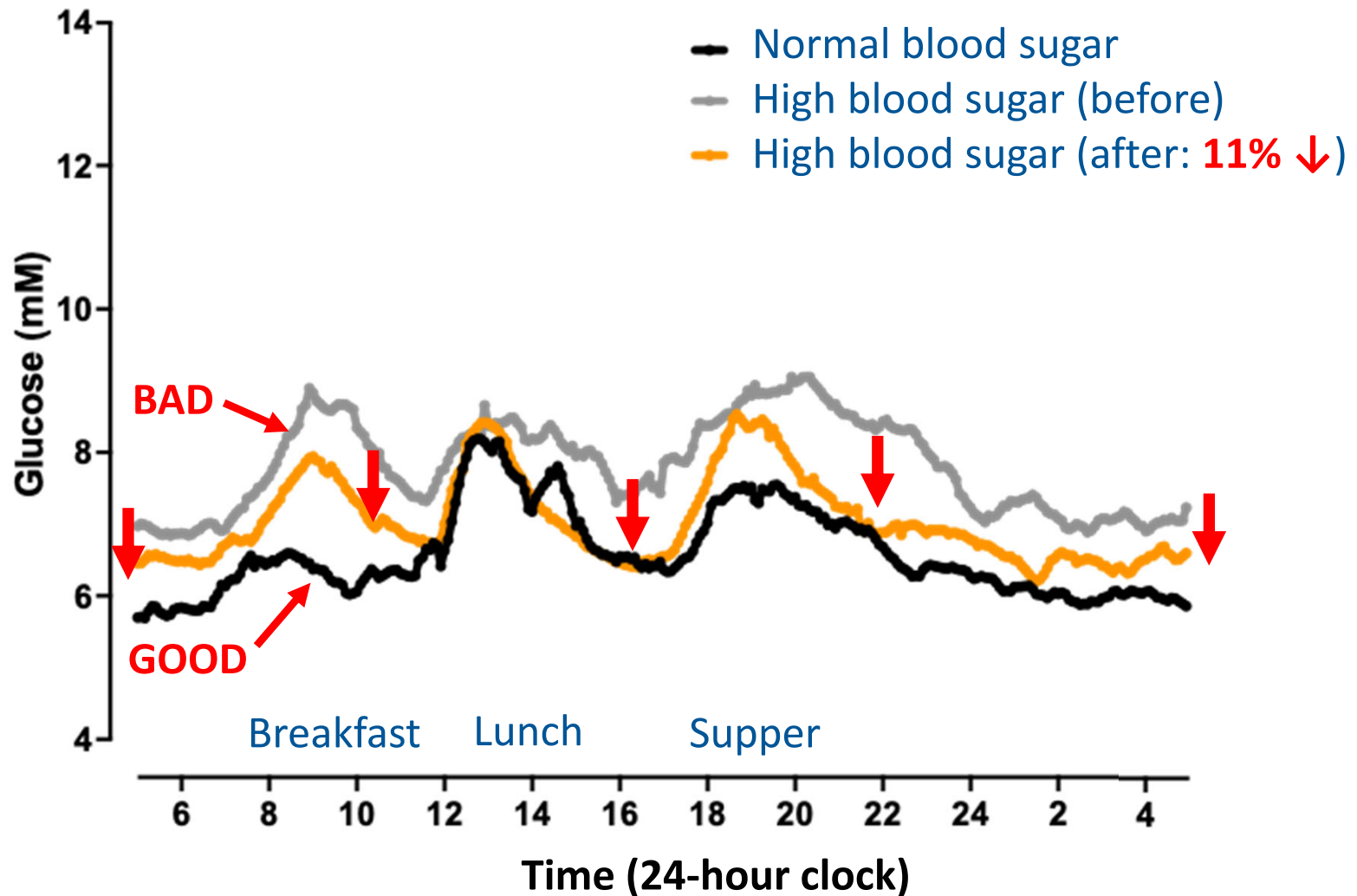
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# 30% lower carbohydrate intake reduces blood sugar (glucose): A 2-month study in a retirement home



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Insulin working better  
Also increased ketones  
Well accepted  
No issue of safety due to cholesterol



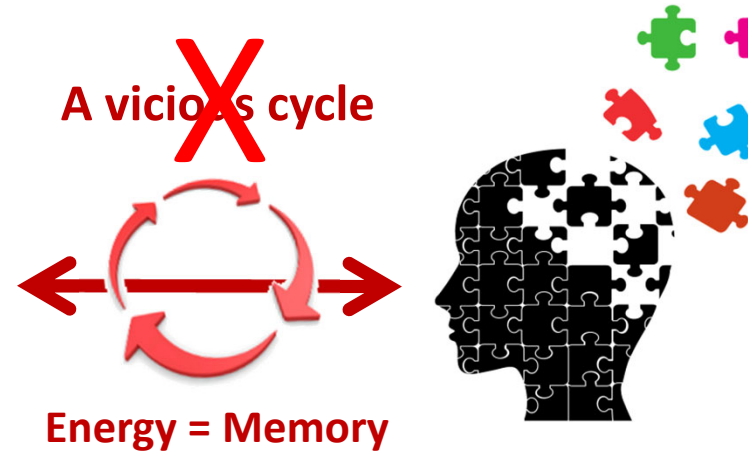
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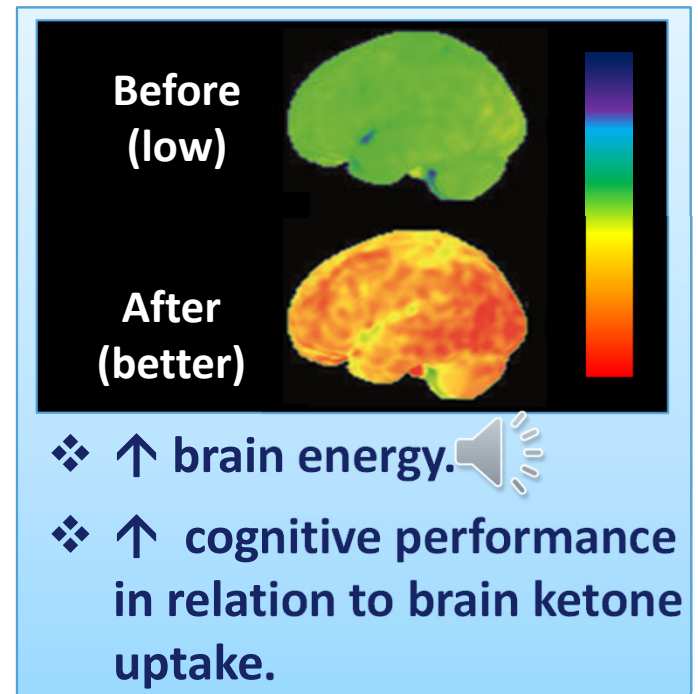
## EMERGING SOLUTIONS



① KETONES  
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③ DECREASE DIETARY SUGAR, ADD KETONES

② EXERCISE + KETONES





## Better brain fuel = better memory

- Reduce dietary sugar (reduces insulin; produces more ketones)
- Table sugar (sucrose) is not brain sugar (glucose)
- Add an MCT or a ketone supplement
- Intermittant fasting
- Do some exercise - moderate but regular
- Also: aim to sleep better, stay connected



**Research team and collaborators**

**Participants**

**Funding partners**

**THANK YOU !**

Website: [recherche-cerveau-sherbrooke](http://recherche-cerveau-sherbrooke)

