

Summation -

Neurological: Prior to this flight it had been reasonably established that a vestibular sensory conflict between the gravity sensitive otolith ^{organs} and gravity independent semicircular vestibular & canals sends signals to brain and gut to cause ^{symptoms & signs} SMS. The method by which ~~is~~ the signals are developed and transmitted is still very much in doubt. These signals ~~are~~ could be either ^{nerve} nervous impulses ^{for} the entire ^{path} way or ^{either} nervous impulses which produce classic hormones or the more recently known. If it is the latter there must be a combination of ~~the~~ gut or neuro hormones. ~~The implication~~ ~~for two~~ & nerve & hormone pathways.

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At our present state of ignorance
we can only guess at possible pathways
eg - ~~are~~ do nerves ~~or~~ by product of
~~nerve action~~ stimulate some hormone
producing area directly to produce an ^{biochemical} agent
to act ~~directly~~ on brain and gut
or is there some intermediary ^{chemical & fluid} ~~chemical~~
pathway such as the cerebrospinal fluid.
The ~~difference~~ practical implications
~~for treatment~~ are significant for
there is a far better chance for
intervention i.e. prevention or treatment
in a chemical than a nervous path.
The time required to develop SMS and actual
recovery rate ~~here~~ ~~It~~ might also be significant
for while hormonal signals can act

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in seconds ~~one ten~~ they are generally
^{their effects}
 slower than and wax and wane more
 slowly than those from nerve alone.

^{anecdotal}
 There was also evidence that
^{on exposure to} $\bar{w}$
 SMS could develop rather suddenly, but
^{typical}
 the ~~general~~ course seemed to require ~~hours~~
 an hour or more. In the same way
 termination of symptoms was thought
 to be rapid, ¹⁻² ~~an~~ hours or more but again
 this was based on symptoms. The
^{consistent}
 only objective evidence for presence or
 absence of SMS is gastric motility as
 indicated by bowel sounds.

This ~~the~~ subject produced two

periods of documentation of ~~probable~~
^{considerable}
~~se~~ which have potential significance.

the bowel sound recordings during
15 mins
immediately after launch (~ 7 mins

after weightlessness), and the bowel
sounds and EEG recordings during

recovery. Bowel sounds were suppressed

from the earliest recording ^{time} indicating
was already established

SMS had ~~struck~~ although incidental

comments by the subject indicated otherwise.

Recovery data was more unexpected for

sounds appeared to go from a complete

1. Although ~~the~~ ^{the} ~~apart~~ ^{initial} portion of the EEG
recording was flawed it still contained
valid EEG signals.

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silence to hyperactivity in considerably less than an hour. This was accompanied by a ~~sho~~ 10% increase in resting heart rate over the same period. This hints

~~Unfortunately several others~~
 to me
 strongly, that a major portion of SMS signs & ~~and~~ symptoms are mediated by nerve and until proven otherwise the vagus ^{now} is the signal pathway to the stomach in SMS. Obviously the next step should be verification of this by recording through launch & insertion and over the recovery ^{& affected} period in both normal & subjects & ^{those} period in affected; over in normals to document effects of liftoff itself &

in affected to verify or modify these findings.

Unfortunately the other data, EEG, EGG, EHT & facial color, pupil size & temperature was all lost, because of the unexpected severity of SMS. The P.I. had not anticipated this nor provided backup for it but had assumed someone might install the gear under such circumstance. ~~A completely~~ There are hints and a ~~strong~~ feeling on my part that the subject would have fared better if some ^{operational} assigned tasks & time on the flight deck during this period. Hints from the bowel sound activity which increased during periods of external activity such

1- Lost as regards benefit to SMS study but two hardware techniques were demonstrated for the first time.

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opening of D.L. Bay doors, etc.

Anthropometric -

Although it had been established that height change regularly occurs in weightlessness and the magnitude of this change measured, the time course was unknown. The continued of this phenomena for the first time measurements, made, on this flight are correspond to consistent & previous data and correspond ~~nicely~~ & are compatible & the theory of the expansion. This gives added assurance that this mechanism is now understood, ~~and~~

~~G. EHT~~
G. Sternberg test -