"Practical and welfare considerations when transporting horses"

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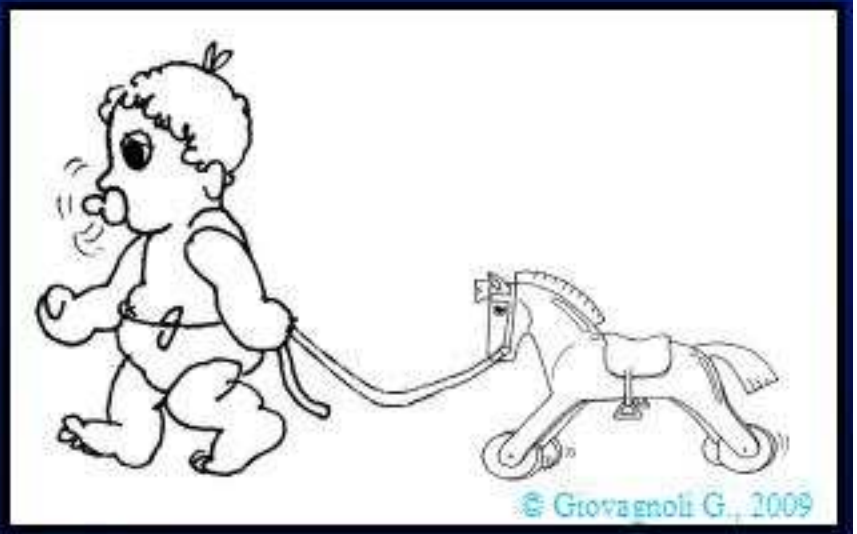
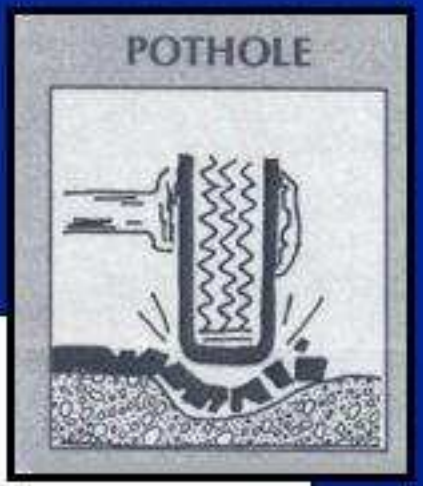
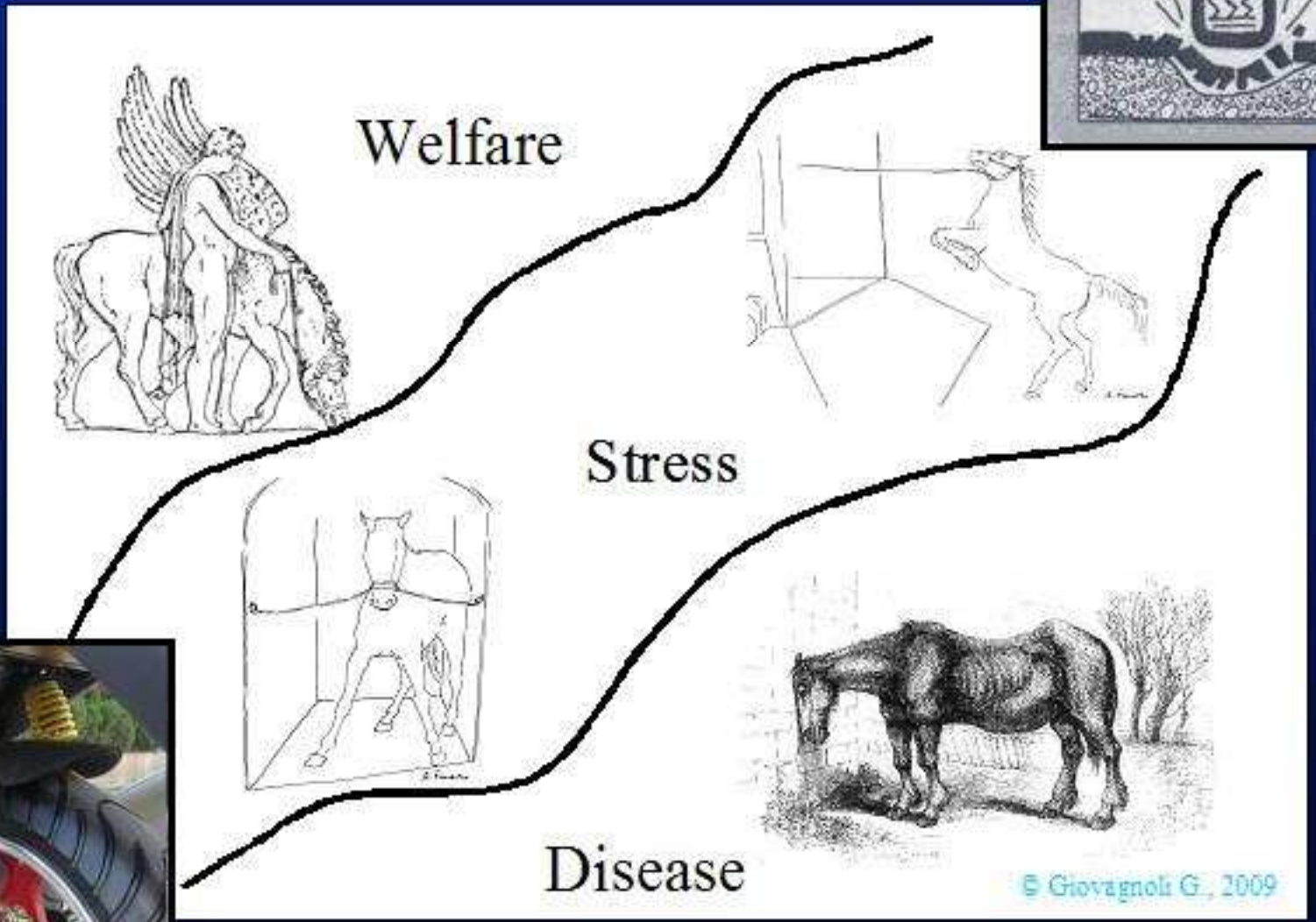


The 1st transport ?

Stress definition

The Stress is a "non-specified" General Adaptation Syndrome (GAS) how the body reacts to the stressors





Welfare Definition

Homeostasis

Death

Satisfaction of all instincts

Pathology

Distress

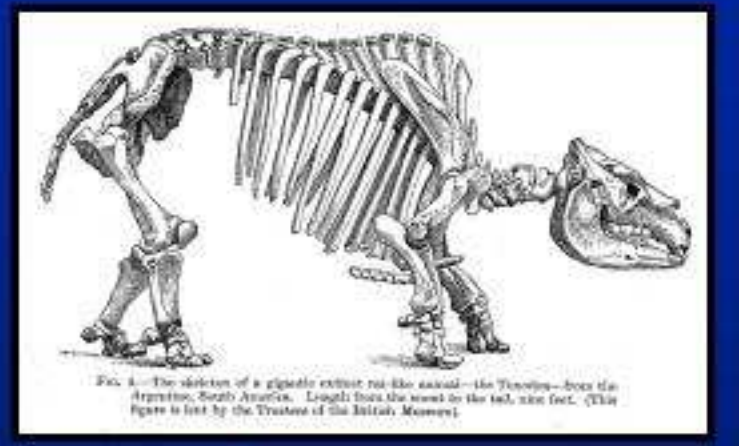
Eustress

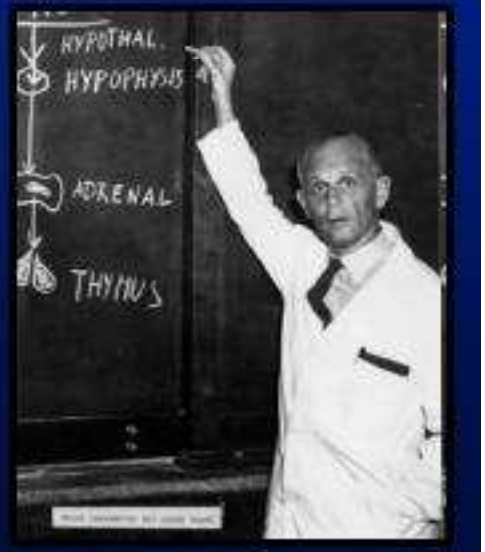
Wellbeing

Immune-suppression + Production

COPING

General Adaptation Syndrome (GAS)





+

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Resistance to the stress

1st Stressor

Time & Normality

Additional Stressors

Alarm Reaction | **Stage of Resistance** | **Exhaustion**

Transport Length

Modified from: H. Selye, 1950

Nervous responses

Hormonal responses

Clinical consequence of hormonal responses

Horse transport data

25 scientific papers analised;
48 parameters investigated, 35 parameters used were not pertinent;

Authors year	Horse N°	Transport Characteristic	Parameter modification	Parameter
Ouragh e coll., 1990	15	By road & aircraift(Rabat-Konakry):39 h.	0	bicarbonates
Ouragh e coll., 1990	15	By road & aircraift(Rabat-Konakry):39 h.	0	calcium
Foss e Lindner, 1996	6	By road: 720 km.	0	chlorine
Ouragh e coll., 1990	15	By road & aircraift(Rabat-Konakry):39 h.	0	chlorine
Ouragh e coll., 1990	15	By road & aircraift(Rabat-Konakry):39 h.	0	iron
Ouragh e coll., 1990	15	By road & aircraift(Rabat-Konakry):39 h.	0	phosphates
Foss e Lindner, 1996	6	By road: 720 km.	0	potassium
Ouragh e coll., 1990	15	By road & aircraift(Rabat-Konakry):39 h.	0	potassium
Foss e Lindner, 1996	6	By road: 720 km.	0	sodium
Ouragh e coll., 1990	15	By road & aircraift(Rabat-Konakry):39 h.	0	sodium
Ouragh e coll., 1990	15	By road & aircraift(Rabat-Konakry):39 h.	0	Alkaline phosphatase
Petazzi e Ceci, 1982	20	By train >600 km.	0	glucose
Ouragh e coll., 1990	15	By road & aircraift(Rabat-Konakry):39 h.	0	glucose
Ouragh e coll., 1990	15	By road & aircraift(Rabat-Konakry):39 h.	0	urates
Ouragh e coll., 1990	15	By road & aircraift(Rabat-Konakry):39 h.	0	Urea
Baucus e coll., 1990/a	15 (+15 as control)	By road: 792 km. / 12 hours	0	oestrum
Baucus e coll., 1990/a	15 (+15 as control)	By road: 792 km. / 12 hours	0	ovulation
Baucus e coll., 1990/b	15 (+15 as control)	By road: 792 km. / 12 hours	0	early embryonic death

General Adaptation Syndrome / Time

Some Epidemiological Aspects of Equine Respiratory Disease Associated with Transport

Masa-aki OIKAWA* and Ryo KUSUNOSE

Equine Research Institute, Japan Racing Association, 5–27–7 Tsurumaki, Setagaya-ku, Tokyo 154, Japan

In order to obtain the epidemiologic characteristics of equine respirat
transport, a total of 29 Anglo-Arab and Thoroughbred horses were t
1,708 km. The horses were examined to determine whether a clinical
respiratory disease, and the following intrinsic and extrinsic factors

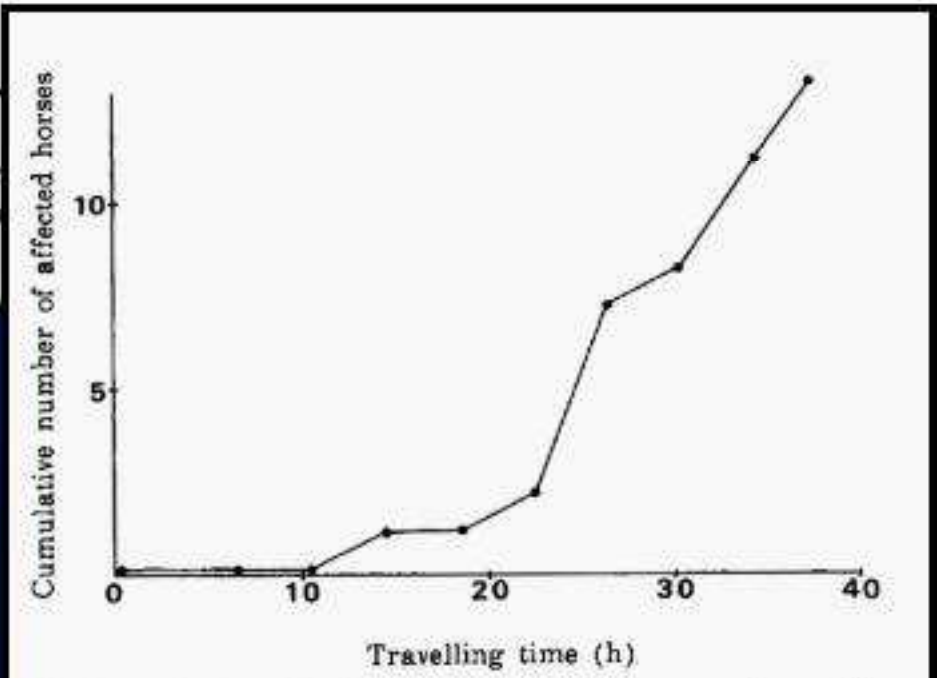
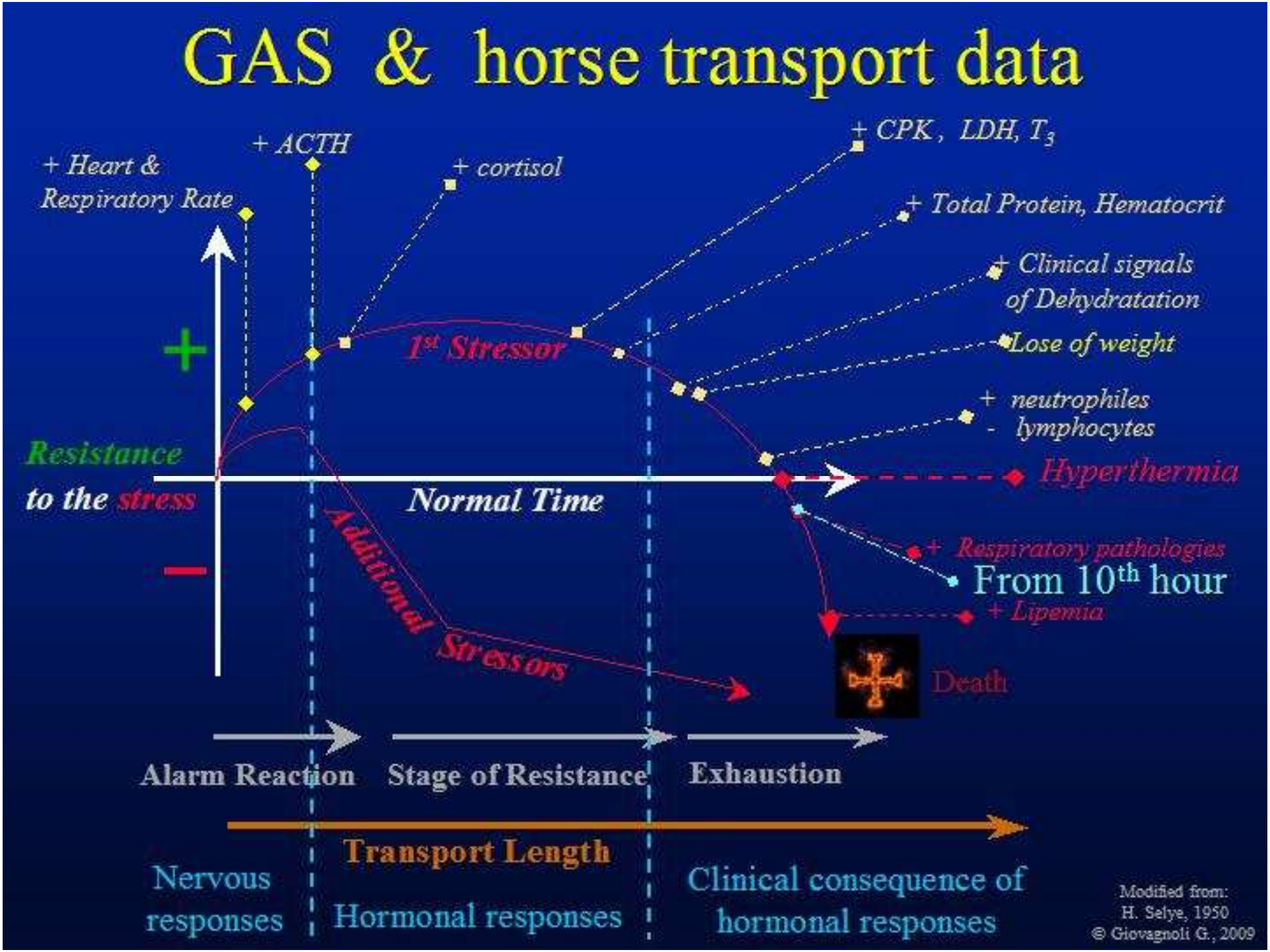


Fig. 3. Relationship between cumulative number of affected horses and travelling time.

Oikawa M. & Kusunose R.
"*Some epidemiological aspects of equine Respiratory disease associated with transport*".
J. Eq. Sc., 6 (1), 1995, pp. 25-29.


GAS & horse transport data
+ Heart & Respiratory Rate
+ ACTH
+ cortisol
+ CPK, LDH, T_3
+ Total Protein, Hematocrit
+ Clinical signals of Dehydratation
Lose of weight
+ neutrophiles
- lymphocytes
Hyperthermia
+ Respiratory pathologies
From 10th hour
+ Lipemia
Death
1st Stressor
Additional Stressors
Resistance to the stress
Normal Time
Alarm Reaction
Stage of Resistance
Exhaustion
Transport Length
Nervous responses
Hormonal responses
Clinical consequence of hormonal responses
Modified from: H. Selye, 1950
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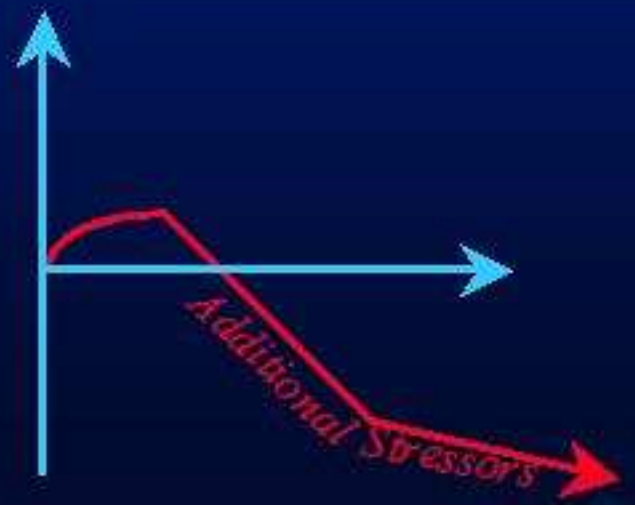
General Adaptation Syndrome adapted to transport time - considerations

Between 20-40 minutes, the metabolic parameters (i.e. chemicals, hormonal or haematological) change very seldom; whereas the hyper-acute parameters are significantly modified (e.g. heart and respiratory rate, muscular activities, etc.);

Within 7-10 hours, it is possible to observe signs of an hormonal involvement in the adaptive response (e.g. immunity suppression, loss of total body weight, lipaemia, etc);

The magnitude of **transport stress** depends:
not only on **transport duration**,
but also on **presence of other factors and from their quality and quantity**.



Fortuitous circumstances

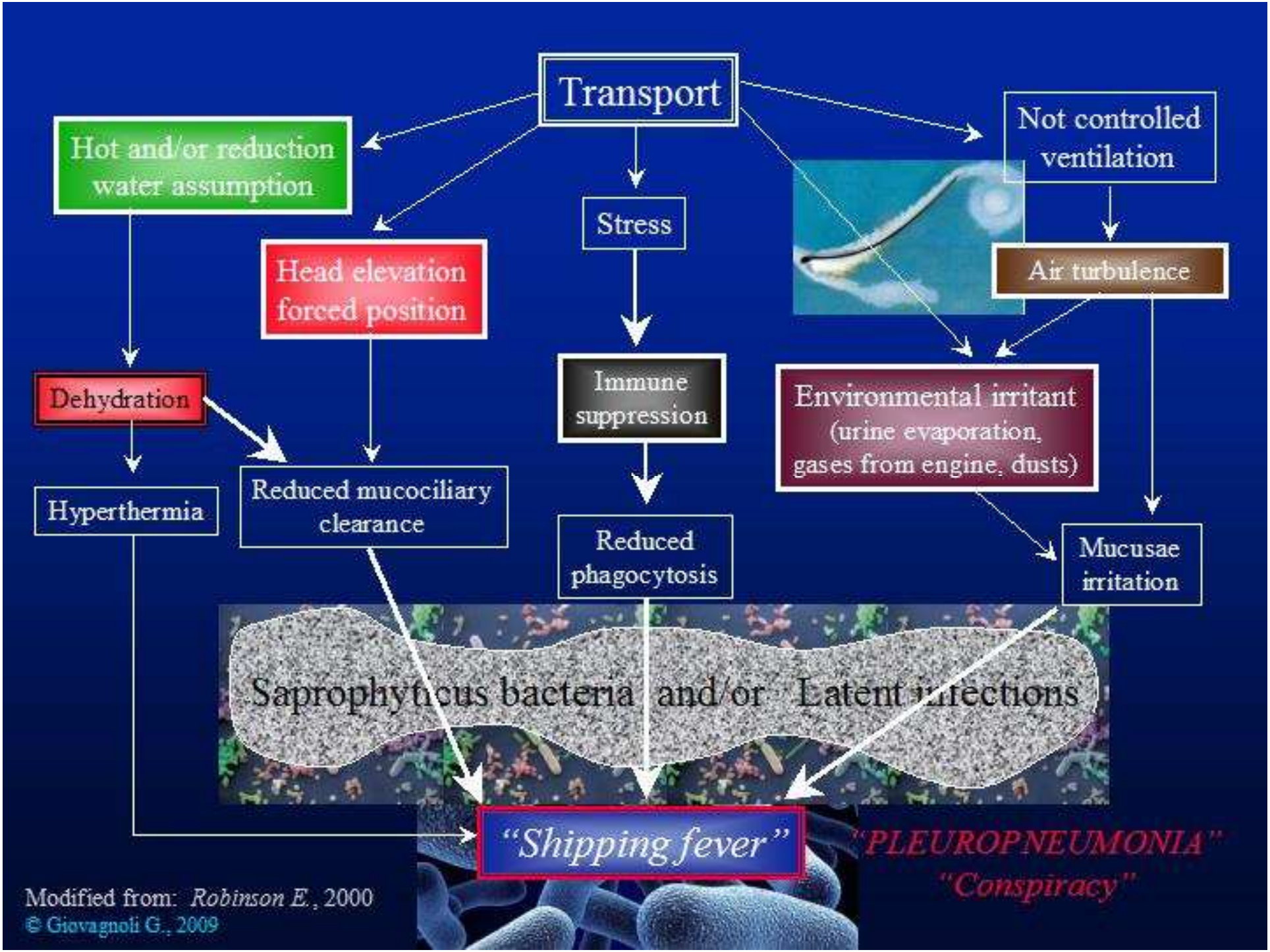
"Practical considerations"

Different levels of adaptations

Stressors
input

outputs

Individual characteristics


Transport
Hot and/or reduction water assumption
Not controlled ventilation
Stress
Head elevation forced position
Air turbulence
Dehydration
Immune suppression
Environmental irritant (urine evaporation, gases from engine, dusts)
Hyperthermia
Reduced mucociliary clearance
Reduced phagocytosis
Mucusae irritation
Saprophyticus bacteria and/or Latent infections
"Shipping fever"
"PLEUROPNEUMONIA"
"Conspiracy"
Modified from: Robinson E., 2000
© Giovagnoli G., 2009

Incorrect positioning of animals

Obligatory position of animals

Steep ramp

Inadequate padding

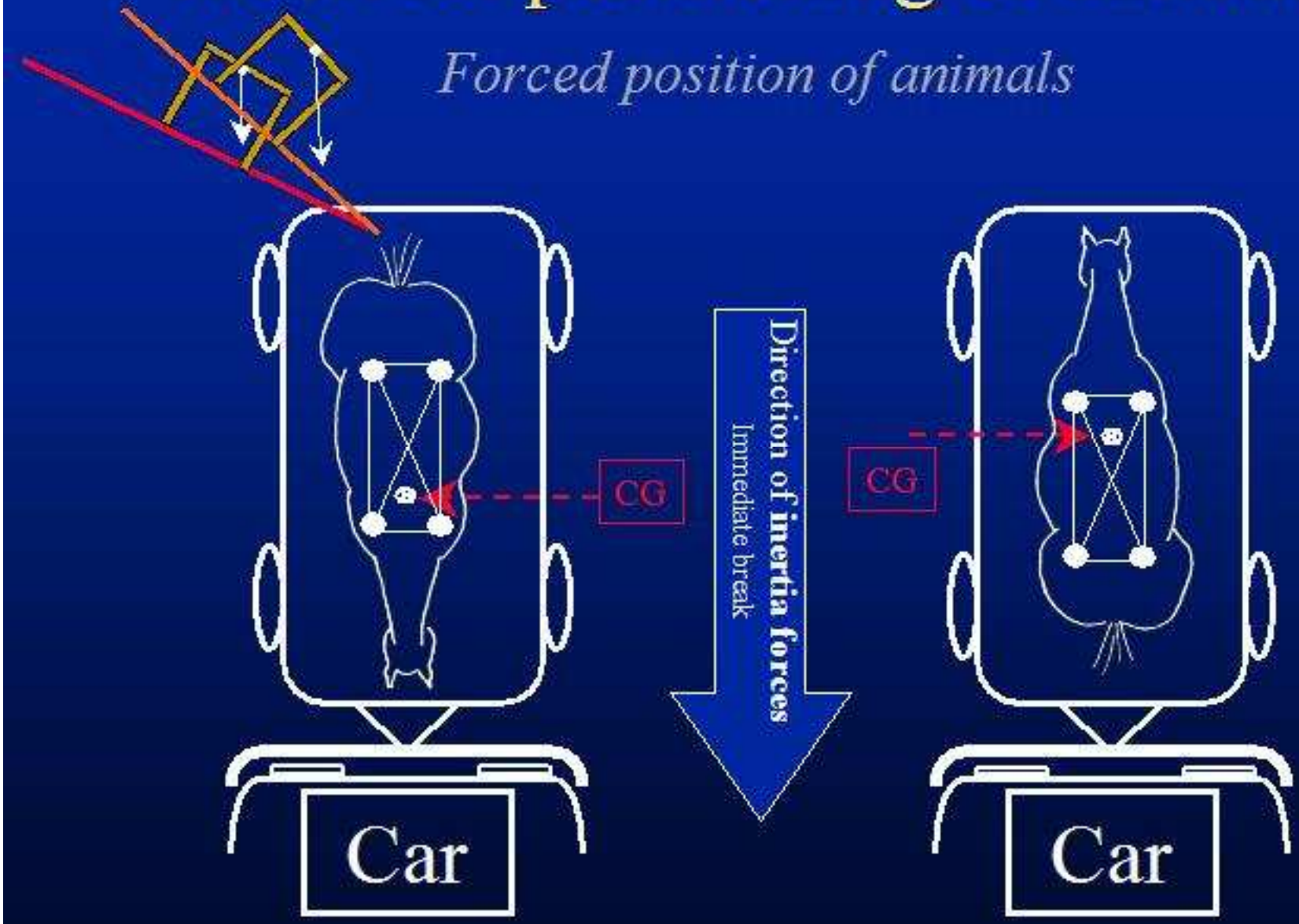
Insufficient space

Slippery ground

Trauma

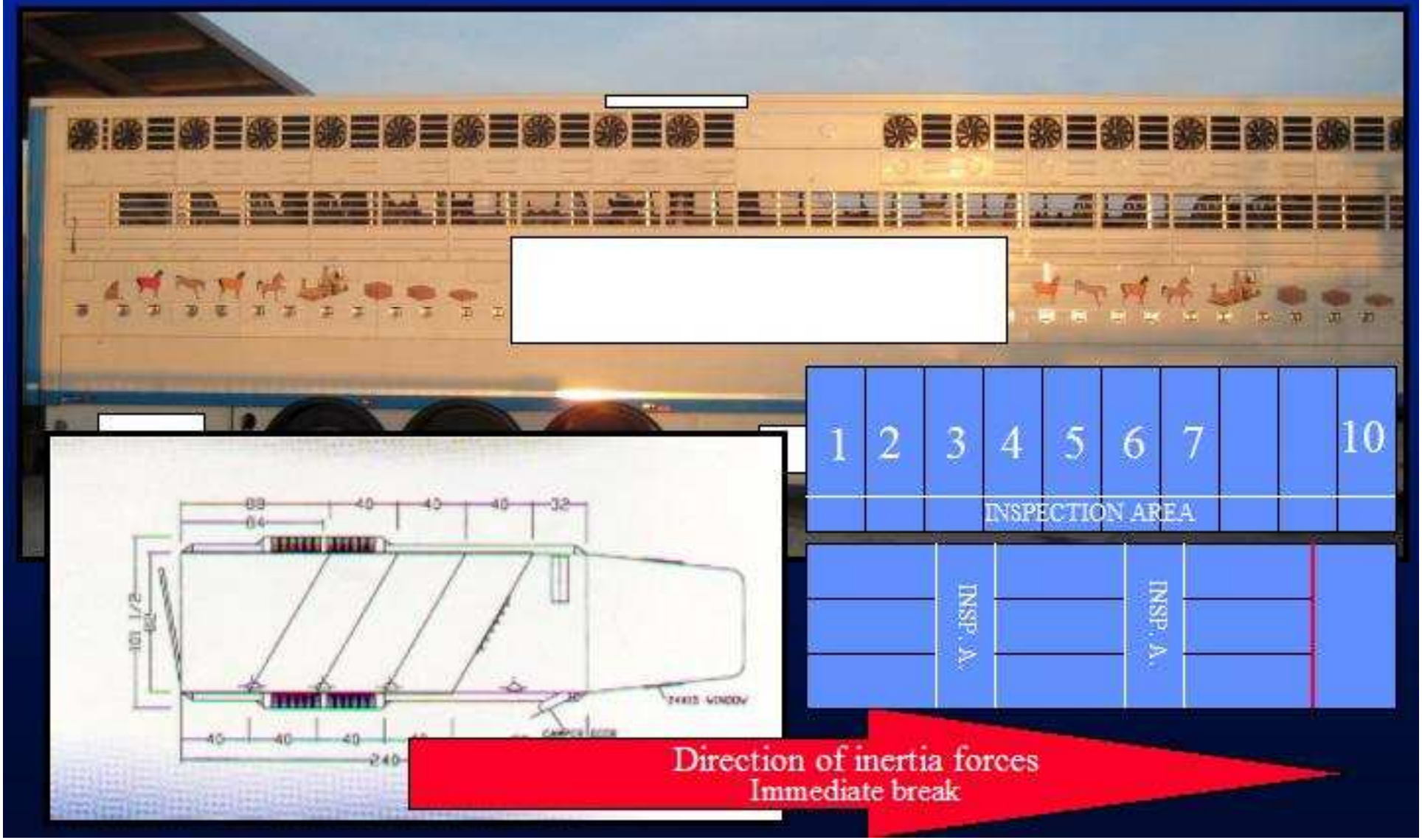
Incorrect positioning of animals

Forced position of animals



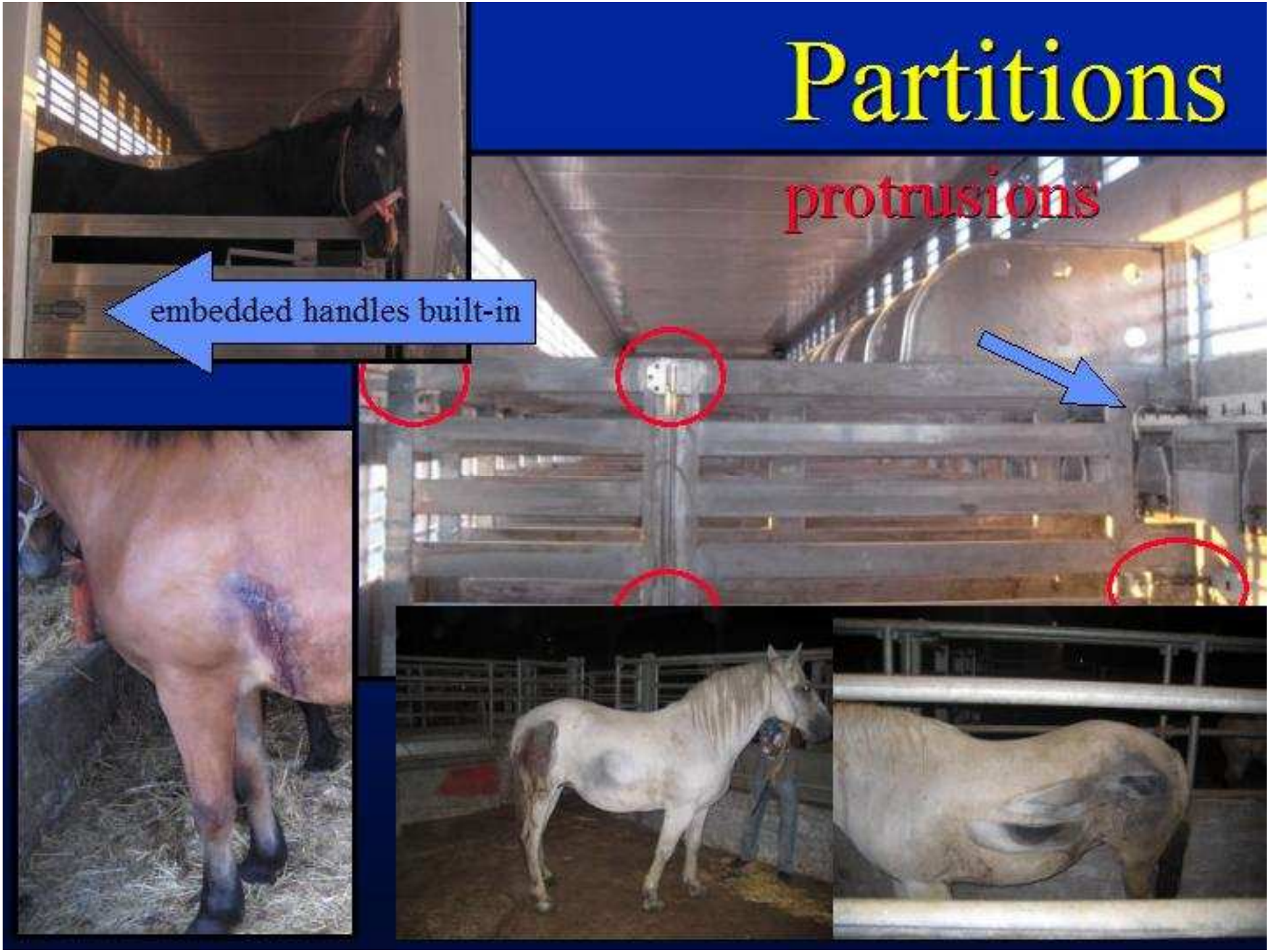
Incorrect positioning of animals

Forced position of animals




Paddings
Partitions

Partitions



Factors affecting horse transportation - 2

Environment

From: *Giovagnoli G.; 2000*

Noise (traffic, noisy loading and unloading of close vehicles , etc.).

Excessive light and/or absence (loading/unloading against the sun, late night arrival in places scarcely lit, etc.).

Temperature and humidity (season, latitude, local climate situation, etc.).

Bad roads (holes, bumps, etc.).

Chosen journey (motorway, main roads, slopes, tunnels, bends, etc.).

Factors affecting horse transportation - 3

Individual

From: *Giovagnoli G.; 2009*

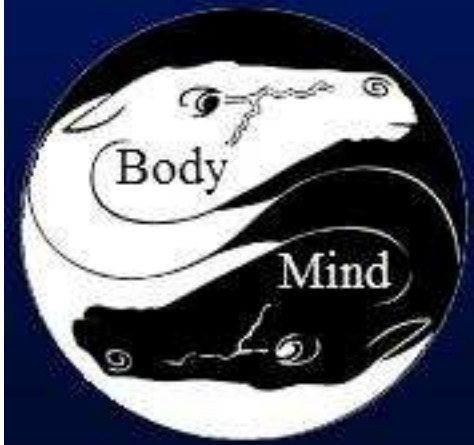
Genetic predisposition to stress or specific pathologies (species, breed, etc.) [e.g. Hyperkalemic periodic paralysis].

Inadequate nutritional status (management/sanitary situations prior to the transportation).

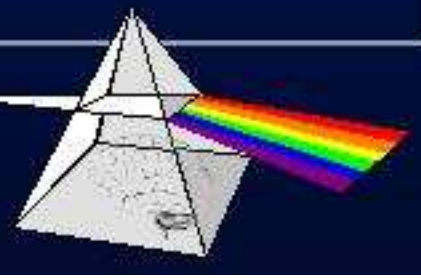
Excessive nutritional status, difficult heat dispersion, muscular and cardiac wear, etc. (prior to the transportation).

Inadequate health status (latent pathologies prior to the transportation, etc.).

Previous experiences (positive or negative reinforcements, waiting behaviour, etc.).



Memory



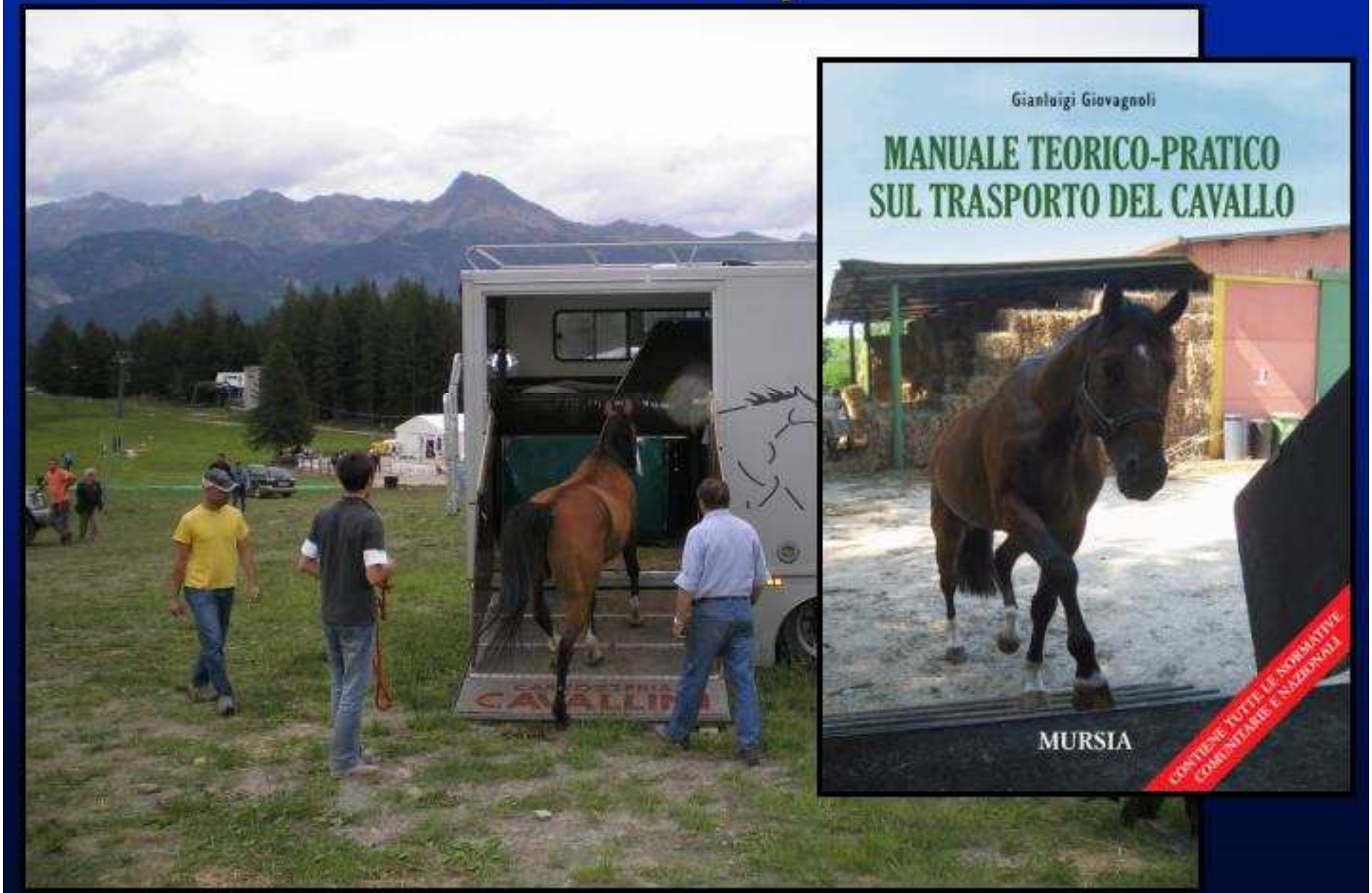
Inadequate health / nutritional status

Fit to be transported ?


Loading - Unloading


Memory
Giovagnoli G., 2009

Memory


Gianluigi Giovagnoli
MANUALE TEORICO-PRATICO
SUL TRASPORTO DEL CAVALLO
MURSIA
CONTIENE TUTTE LE NORMATIVE COMUNITARIE E NAZIONALI

Ground certain solidity & proprioception

Noise

Air shortage/quality

Movement limitations

Shake, vibration, muscular efforts

Time indetermination

Factors affecting horse transportation - 4

Driver

From: *Giovagnoli G.; 2000*

Individual's driving skills (experience, motivation, ability, etc.).
Organizational skills in planning the journey: duration, breaks, itinerary, timetable, etc. (see above).
Ability to manage animals during loading, unloading and transportation (see above).
Behaviour. Haste, anxiety, tiredness, sleep, digestive disorders, alcohol, drugs (traffic jams, breakdown unexpected problems, accidental circumstances, etc.).
Inadequate cleanness of vehicle (experience, motivation, ability, etc.).
Inadequate health status (experience, ability, accidental circumstances, etc.)

Colic etiopathogenesis

From: *Giovagnoli G., 2009*

Immobility

Dehydration

Hot environment and/or reduction of water assumption

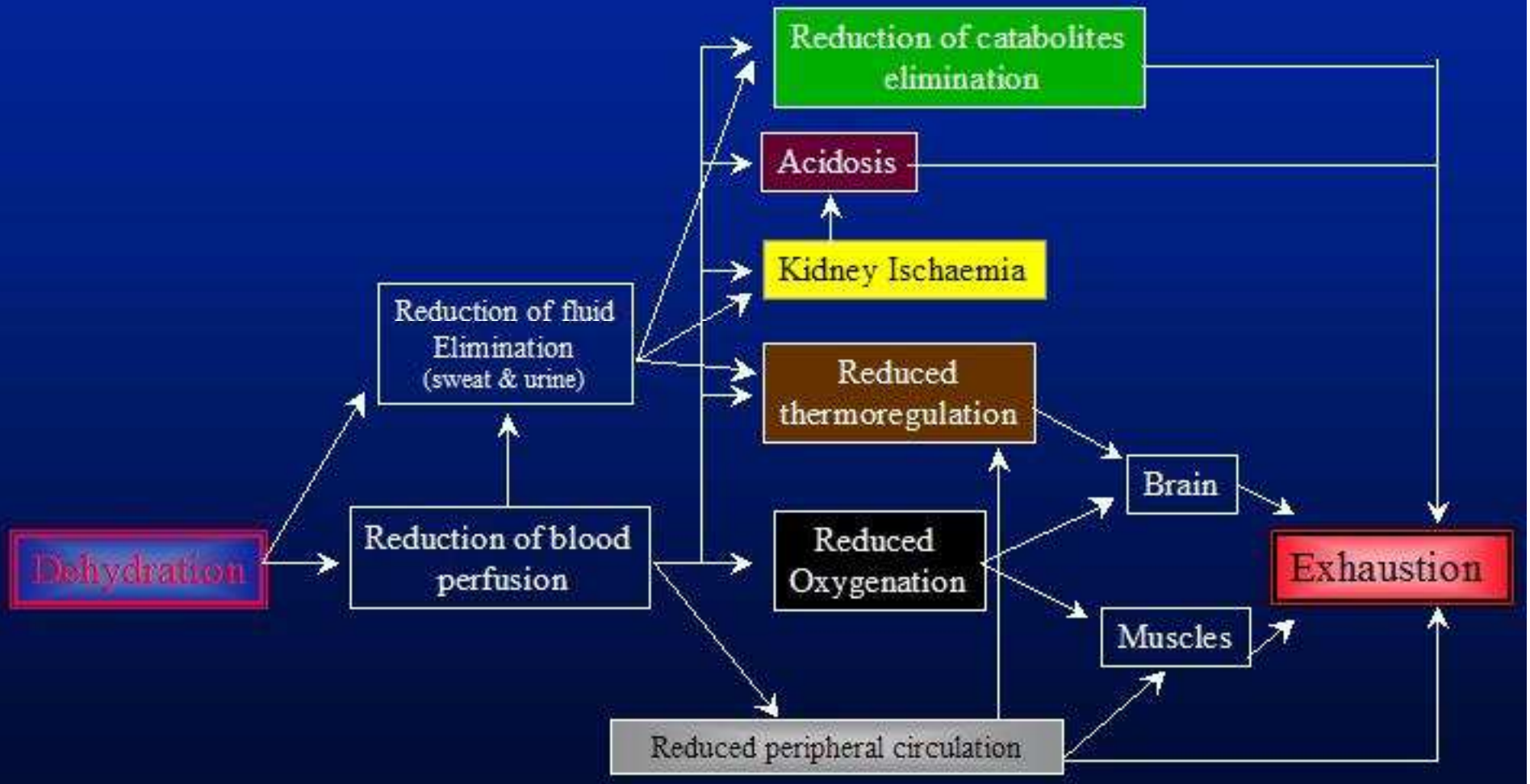
More absorption of water from faeces

Faeces more dehydrated

Constipation

Colic

Dehydration & Exhaustion



From: *Giovagnoli G.; 2009*

Dehydration consequences

Dehydration

"Shipping fever"

Colic

Metabolic alterations

"Conspiracy"

Exhaustion

Haste, hurry & anxiety

Balance preservation

Essential references:

Ferlazzo et al. 1984
Roberts, 1990
Clark et al., 1993;
Stull, 1997
Gibbs and Friend, 1999;
Collins et al., 2000
Stull and Rodiek, 2002
Giovagnoli et. al. 2002

Conclusions

Crucial: hydration
during transportation !!!

Thank you for your attention !

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