31° congresso nazionale ANIARTI , 14-16 Novembre 2012
Infermieri e qualità di vita in area critica

TESTA A POSTO
le raccomandazioni per il trauma cranico

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Guidelines for the Management of Severe Traumatic Brain Injury

3rd Edition

A Joint Project of the

Brain Trauma Foundation

Improving the Outcome of Brain Trauma Patients Worldwide

and

American Association of Neurological Surgeons (AANS)

Congress of Neurological Surgeons (CNS)

AANS/CNS Joint Section on Neurotrauma and Critical Care

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Nursing Management of Adults with Severe Traumatic Brain Injury

AANN Clinical Practice Guideline Series

without ICP or CPP as keywords. The search was primarily restricted to works in English published in 2000–2009 in which all or part of the sample included adults with severe TBI. Few studies were found on certain nursing interventions. In these instances, the search was expanded to include the years 1997–1999 for relevant works. The reference lists of identi-

D. Levels of Evidence Supporting the Recommendations

- Class I: Randomized controlled trial without significant limitations or metaanalysis
- Class II: Randomized controlled trial with important limitations (e.g., methodological flaws or inconsistent results), observational studies (e.g., cohort or case-control)
- Class III: Qualitative studies, case study, or series
- Class IV: Evidence from reports of expert committees and/or expert opinion of the guideline panel, standards of care, and clinical protocols

The Clinical Practice Guidelines and recommendations for practice are established based upon the evaluation of the available evidence (AANN, 2005, adapted from Guyatt & Rennie, 2002; Melnyk, 2004):

- Level 1 recommendations are supported by class I evidence.
- Level 2 recommendations are supported by class II evidence.
- Level 3 recommendations are supported by class III and IV evidence.

One of the central concepts that emerged from research is that all neurological damage from TBI does not occur at the moment of impact, but evolves over the ensuing hours and days. Furthermore, improved outcome results when these secondary, delayed insults, resulting in reduced cerebral perfusion to the injured brain, are prevented or respond to treatment. This is reflected in the

Guidelines for the managment of severe traumatic brain injury

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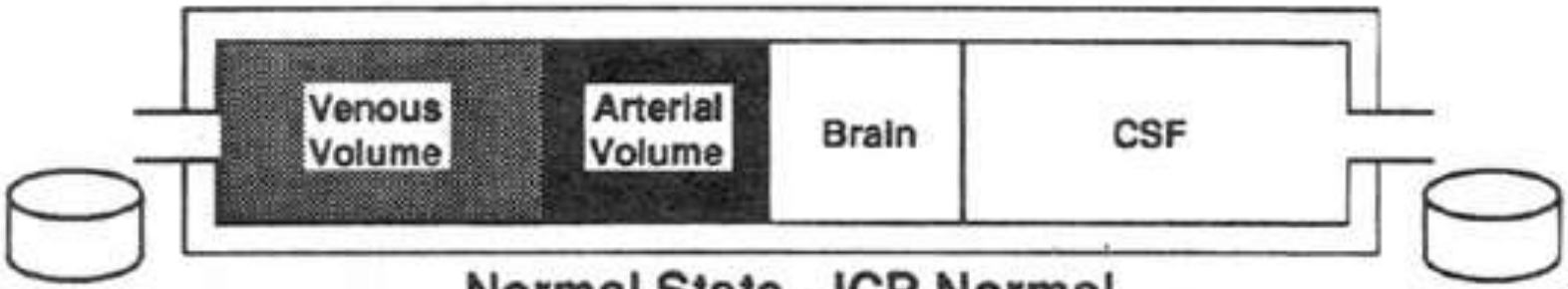
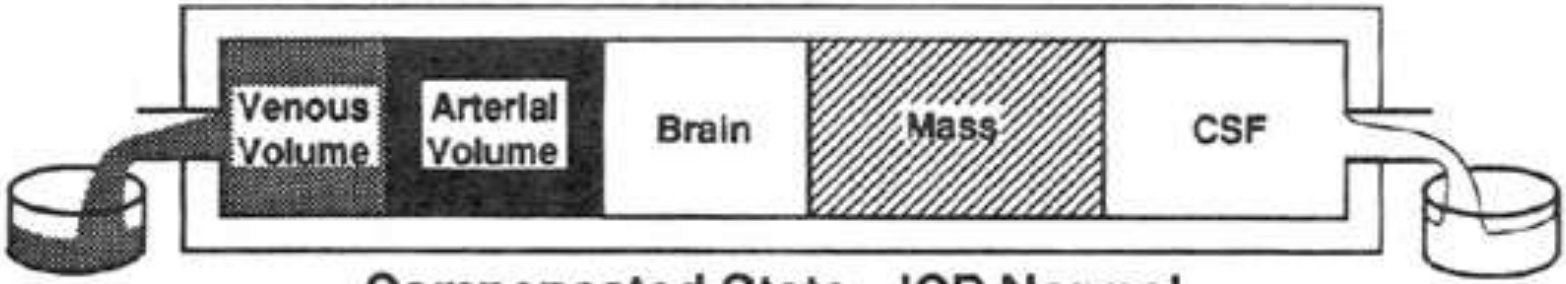
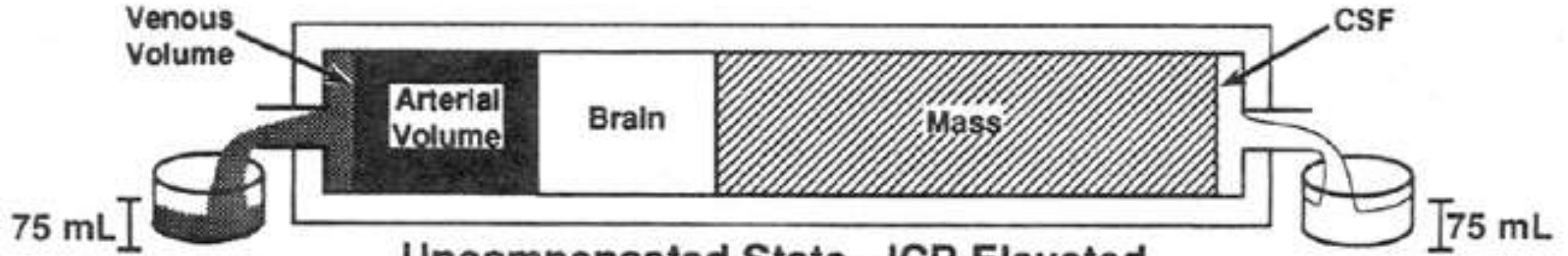
INTRACRANIAL COMPENSATION FOR EXPANDING MASS



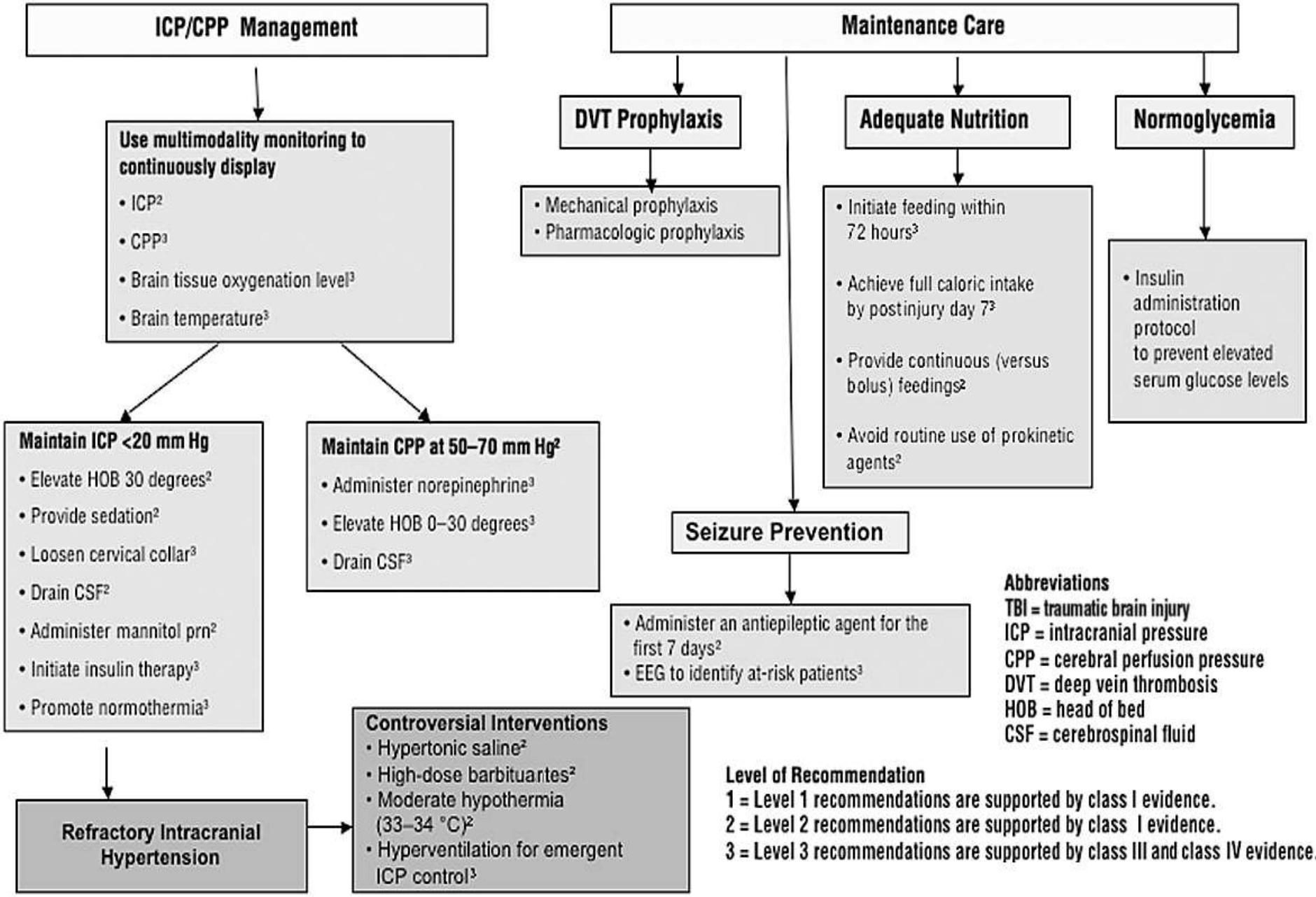
Normal State - ICP Normal



Compensated State - ICP Normal



Uncompensated State - ICP Elevated


ICP/CPP Management
Use multimodality monitoring to continuously display
• ICP[2]
• CPP[3]
• Brain tissue oxygenation level[3]
• Brain temperature[3]
Maintain ICP <20 mm Hg
• Elevate HOB 30 degrees[2]
• Provide sedation[2]
• Loosen cervical collar[3]
• Drain CSF[2]
• Administer mannitol prn[2]
• Initiate insulin therapy[3]
• Promote normothermia[3]
Maintain CPP at 50–70 mm Hg[2]
• Administer norepinephrine[3]
• Elevate HOB 0–30 degrees[3]
• Drain CSF[3]
Refractory Intracranial Hypertension
Controversial Interventions
• Hypertonic saline[2]
• High-dose barbituantes[2]
• Moderate hypothermia (33–34 °C)[2]
• Hyperventilation for emergent ICP control[3]
Maintenance Care
DVT Prophylaxis
• Mechanical prophylaxis
• Pharmacologic prophylaxis
Adequate Nutrition
• Initiate feeding within 72 hours[3]
• Achieve full caloric intake by postinjury day 7[3]
• Provide continuous (versus bolus) feedings[2]
• Avoid routine use of prokinetic agents[2]
Normoglycemia
• Insulin administration protocol to prevent elevated serum glucose levels
Seizure Prevention
• Administer an antiepileptic agent for the first 7 days[2]
• EEG to identify at-risk patients[3]
Abbreviations
TBI = traumatic brain injury
ICP = intracranial pressure
CPP = cerebral perfusion pressure
DVT = deep vein thrombosis
HOB = head of bed
CSF = cerebrospinal fluid
Level of Recommendation
1 = Level 1 recommendations are supported by class I evidence.
2 = Level 2 recommendations are supported by class I evidence.
3 = Level 3 recommendations are supported by class III and class IV evidence.

- ICP
- CPP
- MONITORING
- HICP
- NUTRITION
- GLYCEMIC CONTROL
- SEIZURES

MANAGEMENT ICP

- **< 20 mmHg (level1)**
- Draining CSF decrease ICP (level2)
- Not induce hyperventilation to decrease ICP (level2)
- Administering sedation prevents ICP increases (level2)

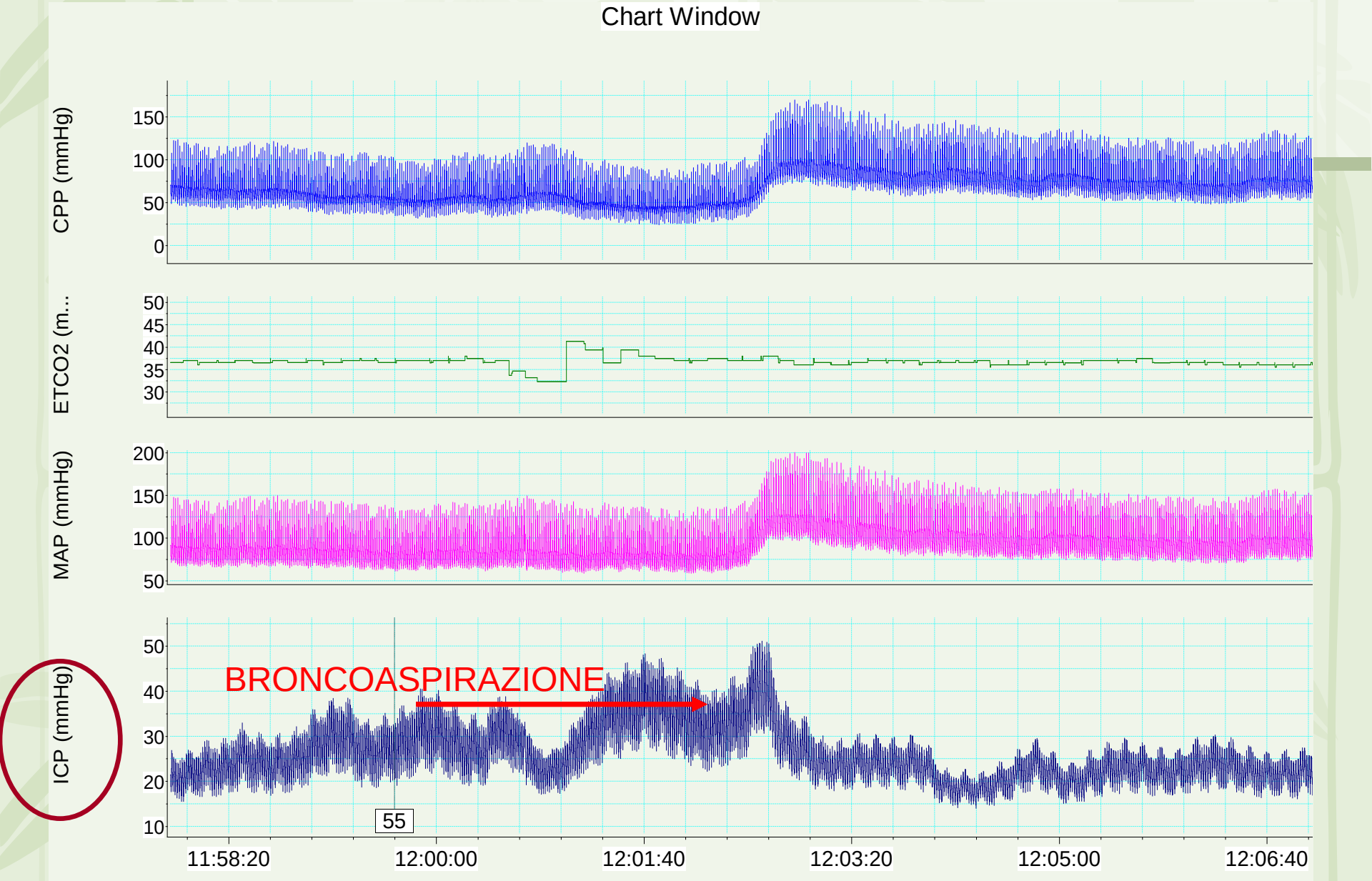


Chart Window
CPP (mmHg)
150
100
50
0
ETCO2 (m...
50
45
40
35
30
MAP (mmHg)
200
150
100
50
ICP (mmHg)
50
40
30
20
10
BRONCOASPIRAZIONE
55
11:58:20
12:00:00
12:01:40
12:03:20
12:05:00
12:06:40

- MANNITOL IS EFFECTIVE IN DECREASING ICP (level 2)
- HEAD OF BED 30° (level 2)
- REMOVING OR LOOSING RIGID CERVICAL COLLAR (level 3)
- NORMOTHERMIA (level 2)

INTRACRANIAL HYPERTENSION

- INDUCING MODERATE HYPOTERMIA 33°-34°C (LEVEL2)
- HYPERTONIC SALINE MAY DECREASE ICP (LEVEL3)
- HYPERVENTILATION RAPIDLY DECREASES ICP IN EMERGENT HICP (LEVEL3)
- HIGH DOSE BARBITURATES (LEVEL2)

MANAGEMENT CPP

- Cpp 50-70 mmHg optimizes cerebral perfusion
- Vasopressor (level3)
- HOB 30°
- CSF drainage

Secondary injury also occurs as a result of altered cerebral blood flow (CBF). Within the first few hours after TBI, a decrease in CBF leaves the brain vulnerable to hypoperfusion due to hypotension or inadvertent hyperventilation. CBF increases 12–24

MONITORING

- CONTINUOS ICP AND CPP MONITORING AND DISPLAY SUCCESSFULLY GUIDE NURSING INTERVENTION (level 2)

- BRAIN TISSUE OXIGEN (PbTo2)
- BRAIN TEMPERATURE

PREVENTING DVT

- PHARMACOLOGIC TREATMENT (LEVEL3)
- MECHANICAL PROPHYLAXIS (LEVEL3)

ADEGUATE NUTRITION

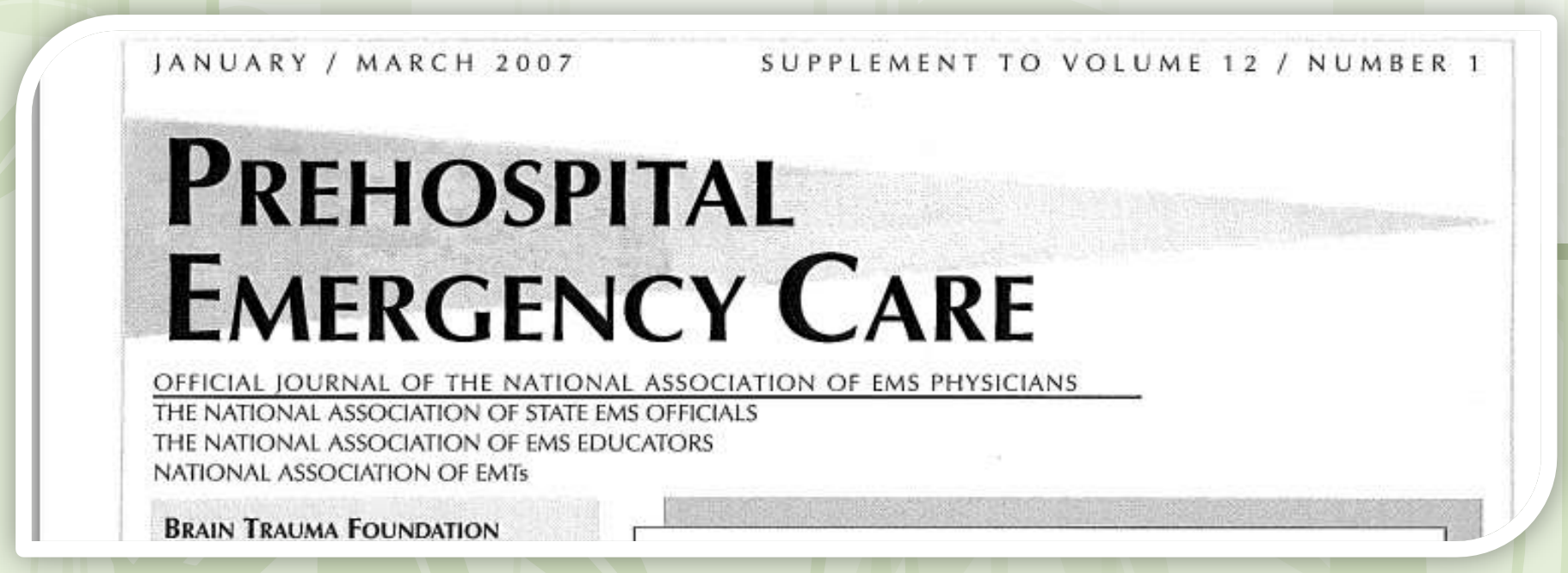
- NUTRITION WITHIN 72 HOURS OF INJURY MAY IMPROVE OUTCOME (level 3)

GLYCEMIA

- **Administering intensive insulin therapy for serum glucose greater than 110 mg/dL improves outcomes (Level 2)**

PREVENTING SEIZURES

- ANTIEPILEPTIC DRUGS DECREASES THE INCIDENCE OF EARLY POSTTRAUMATIC SEIZURES (level 2)
- EEG MAY HELP TO IDENTIFY RISK FOR SEIZURES (level 3)



- AIRWAY! Oxygenation (EtCO2)
- blood pressure (PAS > 90 mmHg)
- GCS
- PUPILS

www.braintrauma.org

Guidelines for the acute medical management of severe traumatic brain injury in infants, children and adolescents

Second edition

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