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DUCROCQ S.C., MEYER P.G., ORLIAGUET G.A., BLANOT S., LAURENT-VANNIER A., RENIER D., CARLI P.A.

Epidemiology and early predictive factors of mortality and outcome in children with traumatic severe brain injury: Experience of a French pediatric trauma center*.

Pediatr. Crit. Care Med., 7 (5), 461-467, 2006

(Services cités : Anesthésie Pédiatrique, Neurochirurgie Pédiatrique)

OBJECTIVE:: To describe the results of an integrated pre- and in-hospital approach to critical care in a large population of children with severe traumatic brain injury and to identify the early predictors of their outcome. DESIGN:: A 9-yr retrospective review of the data of a trauma data bank. SETTING:: Level III pediatric trauma center. PATIENTS:: All children (1 month to 15 yrs) with severe traumatic brain injury (Glasgow Coma Scale </=8) hospitalized in our trauma center and followed until death or for >/=6 months after discharge. INTERVENTIONS:: None. MEASUREMENTS AND MAIN RESULTS:: Univariate and further multivariate analyses were performed to determine independent predictive factors of death and outcome at discharge and 6 months later. The Glasgow Outcome Scale was used to evaluate outcome; a poor outcome referred to Glasgow Outcome Scale >/=3. Receiver operating characteristic curves were drawn to determine the threshold values of predictors of death and outcome. Analysis concerned 585 children (67% male and 33% female). Mean age was 7 +/- 5 yrs. Predominant mechanisms of injury were road traffic accidents and falls. Mean values for Glasgow Coma Scale, Pediatric Trauma Score, and Injury Severity Score were 6 (3-8), 3 (-4,10), and 28 (4-75), respectively. Mortality rate was 22%; Glasgow Outcome Scale was <3 in 53% of the cases at discharge and 60% at 6 months. Multivariate analysis identified Glasgow Coma Scale, Injury Severity Score, and hypotension on arrival as independent predictors of death and poor outcome at discharge and at 6 months. Threshold values for death were 28 for Injury Severity Score and 5 for Glasgow Coma Scale. The same values were found for poor outcome, except for outcome at 6 months where threshold value for the Glasgow Coma Scale was 6. CONCLUSIONS:: Initial hypotension, Glasgow Coma Scale, and Injury Severity Score are independent predictors of outcome in children with traumatic brain injury. Threshold values can be calculated for predicting poor outcome. These variables can be easily and detected early in this population and used for quality assessment.

MEYER P., CUTTAREE H., BLANOT S., ORLIAGUET G., JARREAU M.M., CHARRON B., PERIE-VINTRAS A.C., BAUGNON T., CARLI P.

Anaesthetic resuscitation in the treatment of craniostenoses.

Neurochirurgie, 52 P2 (2-3), 292-301, 2006

(Services cités : Anesthésie Pédiatrique)

MEYER P.G., BONNEVILLE C., ORLIAGUET G.A., DESSEMME P., BLAKIME P., CARLI P.A., REVILLON Y.

Grand mal seizures: an unusual and puzzling primary presentation of ruptured hepatic hydatid cyst.

Paediatr. Anaesth., 16 (6), 676-679, 2006
(Services cités : Anesthésie Pédiatrique, Chirurgie Pédiatrique, SAMU, Radiologie Pédiatrique)
We report a case of hepatic hydatidosis where the first clinical manifestations, generalized seizures after minor head and abdominal trauma, and delayed anaphylaxis, made the primary diagnosis difficult. Severe anaphylaxis has been reported as initial presentation of quiescent hepatic hydatidosis. In endemic areas, the diagnosis must be carefully ruled out in patients experiencing abrupt anaphylactic shock of uncertain etiology. The occurrence of unexplained vascular collapse after minor abdominal trauma in a patient originating from an endemic area should prompt the diagnosis and urgent treatment should be initiated; firstly emergency management of the anaphylactic shock and later, surgical treatment of the cysts.

2005

BAKER D., CAZALAA J.B., CARLI P.
Larrey and Percy-A tale of two Barons.
Resuscitation, 66 (3), 259-262, 2005
(Services cités : Anesthésie Pédiatrique, SAMU)

JOURNOIS D., BAUFRETON C., MAURIAT P., POUARD P., VOUHE P., SAFRAN D.
Effects of inhaled nitric oxide administration on early postoperative mortality in patients operated for correction of atrioventricular canal defects.
Chest, 128 (5), 3537-3544, 2005
(Services cités : Anesthésie Pédiatrique, Chirurgie Cardiaque Pédiatrique)
OBJECTIVE: Postoperative pulmonary hypertension (POPH) substantially increases mortality after repair of congenital heart diseases. Inhaled nitric oxide (NO) has been reported as an effective and specific means of controlling POPH crisis. No randomized, placebo-controlled study has addressed the ability of NO administration to reduce mortality. Such a trial could raise ethical questions. DESIGN: Observational study with historical control subjects based on multivariate confounder scores. SETTING: Surgical pediatric ICU in a university hospital. PATIENTS: Two hundred ninety-four records of patients operated on for atrioventricular (AV) canal between 1984 and 1994 who presented with severe POPH. INTERVENTIONS: All variables found to be predictive for death by univariate tests were entered in a multivariate forward stepwise logistic regression model. Two paired groups regarding risk factors for death and only differing for POPH treatment (NO or conventional treatment) were constructed on the basis of predicted values obtained from this model. Twenty-five patients received NO, and 39 control patients, operated on between 1984 and 1994, received conventional treatment for POPH. MEASUREMENTS AND RESULTS: Postoperative pulmonary pressure, date of operation, and occurrence of an infectious complication were retained in the model. The comparison between the two paired groups showed a significant difference in mortality (24%; 95% confidence interval [CI], 7 to 41%; vs 56%; 95% CI, 37 to 75%, respectively; $p = 0.02$). CONCLUSIONS: This study suggests that there is a high probability for postoperative mortality reduction associated with administration of inhaled NO when severe POPH occurs in children operated for complete repair of AV canal.

MEYER P.G., DUCROCQ S., RACKELBOM T., ORLIAGUET G., RENIER D., CARLI P.
Surgical evacuation of acute subdural hematoma improves cerebral hemodynamics in children: a

transcranial Doppler evaluation.
Childs Nerv. Syst., 21 (2), 133-137, 2005
(Services cités : Anesthésie Pédiatrique, Anesthésie Réanimation)
OBJECTIVE. The objective was to evaluate cerebral hemodynamics in young children with acute subdural hematoma (SDH) and the impact of surgical treatment using transcranial Doppler (TCD). DESIGN. The design was a prospective study of infants with SDH requiring surgical evacuation. SETTING. The setting was the neuro intensive care unit of a university hospital. INTERVENTIONS. Indications for surgical evacuation were based upon clinical and radiological arguments. Surgery included emergency needle aspiration followed by external or/and internal shunting as required. A TCD evaluation was performed before needle aspiration, and after each surgical drainage procedure. It included a pressure provocation test to assess cerebral compliance. Preoperative and postoperative middle cerebral artery (MCA) velocities, Gosling pulsatility (PI) and Pourcelot resistivity (RI) indexes and compliance were compared with Student's t-test, or Fisher's exact test as indicated. MEASUREMENTS AND MAIN RESULTS. Out of 26 infants, 23 (88%) had injuries that had possibly been inflicted, and 3 had accidental injuries. Initial TCD evaluation demonstrated intracranial hypertension with decreased diastolic velocity, increased PI and RI, and decreased compliance. Surgical evacuation resulted in statistically significant improvement in cerebral hemodynamics (diastolic velocity: 17.2+/-10 cm/s vs. 31.1+/-10 cm/s, $p<0.0015$, PI: 2.5+/-1.3 vs. 1.4+/-0.8, $p<0.002$, RI: 0.8+/-0.2 vs. 0.6+/-0.1, $p<0.005$) in all but 3 infants, who eventually died. Surgical drainage (primary shunting or external drainage) was needed in 23 infants and resulted in further improvement in cerebral hemodynamics. Finally, 73% of the infants made a good recovery. CONCLUSIONS. Children with acute bilateral HSD have a high incidence of increased intracranial pressure as assessed by TCD. Surgical evacuation improves cerebral hemodynamics. TCD could be used for assessing the need for, and the efficiency of surgical drainage.

MEYER P.G., MEYER F., ORLIAGUET G., BLANOT S., RENIER D., CARLI P.
Combined high cervical spine and brain stem injuries: a complex and devastating injury in children.
J. Pediat. Surg., 40 (10), 1637-1642, 2005
(Services cités : Anesthésie Pédiatrique, SAMU)
BACKGROUND: In young children, high cervical spine injuries (HCSI) can result in inaugural reversible, cardiac arrest or apnea. We noted in children sustaining such injuries an unusual incidence of associated brain stem injuries and defined a special pattern of combined lesions. METHODS: Children with HSCI surviving inaugural cardiac arrest/apnea were selected for a retrospective analysis of a trauma data bank. Epidemiologic, clinical, and radiological characteristics, and outcome were reviewed and compared with those of the rest of the trauma population with severe neurologic injuries (defined by a Glasgow Coma Scale < 8). RESULTS: Thirteen children with HCSI above the C3 spinal level and inaugural cardiac arrest/apnea were identified and compared with 819 severely head injured children without HSCI. Mean age was 4.7 +/- 2.9 years, and median Glasgow Coma Scale was 3 (3-6) after resuscitation. Initial standard x-ray views missed spine injuries in 6 patients. Spiral computed tomographic (CT) scan showed cervical fracture-dislocations associated with diffuse brain lesions and brain stem injury in all patients. Children with combined lesions had more frequent severe facial and skull base fractures compared with the rest of the population. They also were younger and sustained more frequent severe distracting injury to the neck than the rest of the population. Mortality rate (69%) was 2.6-fold higher than that observed in children without HCSI. In survivors, none demonstrated

spinal cord injury resulting in persistent peripheral neurologic deficits, but only one achieved a good recovery. CONCLUSIONS: Combined HCSI and brain stem injuries must be suspected in young children sustaining a severe distracting injury to the craniocervical junction. Early recognition of these catastrophic injuries by systematic spiral cervical spine and brain stem computed tomographic scan evaluation is mandatory.

2004
CARLI P., ORLIAGUET G.
Severe traumatic brain injury in children.
Lancet, 363 (9409), 584-585, 2004
(Services cités : Anesthésie Pédiatrique, Réanimation Pédiatrique)

2003
LAQUAY N., GHAZOUANI S., VACCARONI L., VOUHE P.
Intrapericardial teratoma in newborn babies.
Eur. J. Cardiothorac. Surg., 23 (4), 642-644, 2003
(Services cités : Anesthésie Pédiatrique, Chirurgie Cardiaque Pédiatrique)
We report two cases of intra pericardial tumor with pericardial effusion, diagnosed in utero by echocardiography at 21 and 28 weeks of gestation. Both fetuses underwent an intra uterine pericardiocentesis to treat a hydrops fetalis. Surgical resection of the tumor was undertaken immediately after birth and histological description reported cystic teratoma. Both babies had a favorable post operative course.

2002
BAKER D.J.
Management of casualties from terrorist chemical and biological attack: a key role for the anaesthetist.
Br. J. Anaesth., 89 (2), 211-214, 2002
(Services cités : Anesthésie Pédiatrique, SAMU)

2001
LEGROS C.B., ORLIAGUET A., MAYER M.N., LABBEZ F., CARLI P.A.
Severe anaphylactic reaction to cisatracurium in a child.
Anesth. Analg., 92 (3), 648-649, 2001
(Services cités : Anesthésie Pédiatrique, SAMU)

ORLIAGUET G., MEYER P., BLANOT S., SCHMAUTZ E., CHARRON B., RIOU B., CARLI P.
Validity of applying triss analysis to paediatric blunt trauma patients managed in a french paediatric level 1 trauma centre.
Intens. Care Med., 27 (4), 743-750, 2001
(Services cités : Anesthésie Pédiatrique, SAMU)
Objective: Using a weighted combination of the Revised Trauma Score (RTS), the Injury

Severity Score (ISS), the type of injury (blunt or penetrating) and patient age, the TRISS method is used to calculate the probability of survival (ps) in trauma patients. The goal of this study was to compare the ability of the American Major Trauma Outcome Study (MTOS) norm for adult blunt trauma patients (ADULT) and the specific norm for paediatric patients (PED) to estimate the ps of injured children using TRISS methodology. Design: Retrospective analysis using a paediatric trauma patient database. Setting: a French level 1 paediatric trauma centre. Patients: Four hundred seven consecutive paediatric blunt trauma patients, treated over a 3-year period. Measurements: The observed and expected survivals were compared, using the M, Wand Z scores, with both ADULT and FED. The W score is the number of survivors more or less than expected from the MTOS predictions for 100 patients. A Z score, which measures the significance of W, between -1.96 and +1.96, indicates no significant difference between observed and expected survivors. A value of M less than 0.88 indicates a disparity in the severity match between the study group and the MTOS group. We calculated the standardised W score (Ws), which represents the W score that would have been observed if the case mis of severity was identical to that of the MTOS group. Accordingly, a standardised Z score (Zs) was also calculated. In addition, we calculated the area under the receiver operating curve (aROC) using both norms, while calibration was also assessed by calculation of the Hosmer-Lemeshow goodness-of-fit tests. Results: Using FED, the number of actual survivors (n = 364) was not significantly different from the MTOS (n = 358). The value of M: 0.65, indicated a disparity in the severity match between the study group and the MTOS group, due to a higher proportion of patients with lower ys (TRISS < 0.95, 52 vs 27 %. Ws was +1.06 % (95 % confidence interval -0.34 to 2.08) and Zs was 1.48, indicating no significant difference from the MTOS. Using ADULT, the number of observed survivors (n = 364) was significantly higher than that expected (n = 354), with a W score of +2.70% (Z = +1.98, p < 0.05). There was a disparity in the severity match (M = 0.67) between the study group and the MTOS group: due to a higher proportion of patients with lower ps. Ws was +1.32 % (95 % confidence interval -0.12 to 2.37) and Zs = +1.79 (NS), indicating no significant difference from the MTOS. The Hosmer-Lemeshow statistics indicated that ADULT (Cg = 7.24, p = 0.51; Hg = 4.45, p = 0.81) and PED (Cg = 6.08, p = 0.64; Hg = 3.55. p = 0.90) provided sufficient goodness-of-fit. There was no significant difference in the aROC of the TRISS between the two norms (0.935 <plus/minus> 0.050 vs 0.936 +/- Q.O50: NS), Conclusion: Both adult and paediatric norms were equally good predictors of the probability of survival of injured children, provided that Ws and Zs are used when there is a disparity in the severity match between the study group and the MTOS group. [References: 45]

2000

BONHOEFFER P., BOUDJEMLINE Y., SALIBA Z., MERCKX J., AGGOUN Y., BONNET D., ACAR P., LE BIDOIS J., SIDI D., KACHANER J.

Percutaneous replacement of pulmonary valve in a right-ventricle to pulmonary-artery prosthetic conduit with valve dysfunction.

Lancet, 356 (9239), 1403-1405, 2000

(Services cités : Cardiologie Pédiatrique, Anesthésie Pédiatrique)

Background Valved conduits from the right ventricle to the pulmonary artery are frequently used in paediatric cardiac surgery. However, stenosis and insufficiency of the conduit usually occur in the follow-up and lead to reoperations. Conduit stenting can delay surgical replacement, but it aggravates pulmonary insufficiency. We developed an innovative system for percutaneous stent implantation combined with valve replacement. Methods A 12-year-old boy with stenosis and

insufficiency of a prosthetic conduit from the right ventricle to the pulmonary artery underwent percutaneous implantation of a bovine jugular valve in the conduit. Findings Angiography, haemodynamic assessment, and echocardiography after the procedure showed no insufficiency of the implanted valve, and partial relief of the conduit stenosis. There were no complications after 1 month of follow-up, and the patient is presently in good physical condition. Interpretation We have shown that percutaneous valve replacement in the pulmonary position is possible. With further technical improvements, this new technique might also be used for valve replacement in other cardiac and non-cardiac positions. [References: 20]

MEYER P.G., ORLIAGUET G.A., ZERAH M., CHARRON B., JARREAU M.M., BRUNELLE F., LAURENT-VANNIER A., CARLI P.A.
Emergency management of deeply comatose children with acute rupture of cerebral arteriovenous malformations.
Can. J. Anaesth., 47 (8), 758-766, 2000
(Services cités : Radiologie Pédiatrique, Anesthésie Pédiatrique, Anesthésie Réanimation, Neurochirurgie Pédiatrique)
Purpose: To assess the impact of emergency management on mortality and morbidity of acute rupture of cerebral arteriovenous malformations resulting in deep coma in children, and the factors predicting outcome. Methods: Retrospective chart review of 20 children with a Glasgow Coma Scale less than or equal to 8 with acute hemorrhagic stroke from a cerebral arteriovenous malformation rupture was conducted. Protocol included: early resuscitation with tracheal intubation and ventilation after induction of anesthesia with sufentanil, and benzodiazepine, and mannitol 20% or hypertonic saline 7,5% infusion for life-threatening brain herniation. Radiological exploration was limited to contrast-enhanced CT scan preceding immediate surgical decompression. Postoperatively, children were deeply sedated and intracranial pressure monitoring allowed titration with osmotherapy, vasopressors, hyperventilation or barbiturate coma to control cerebral perfusion pressure. Analysis used stratification of the type of hemorrhage (supra or infra tentorial), location (intraparenchymal and subarachnoid, intraparenchymal and intraventricular or intraventricular alone) and relationship between presentation, evolution with resuscitation, type of cerebral lesion, and outcome. Results: Patients had a severe initial presentation (median Glasgow Coma Scale five), eight had unilateral and eight bilateral third nerve palsy. Compressive hematoma in supratentorial localisation represented 75% of the cases. Global mortality was 40%. Persistence of mydriasis after resuscitation increased mortality to 75%. Massive intraventricular flooding was associated with increased mortality. Good functional outcome was achieved in survivors, Conclusion: Acute rupture of an AVM can result in rapidly progressing coma. Emergency management with early resuscitation, minimal radiological exploration before rapid surgical decompression results in a mortality rate of 40%, but a good functional outcome can be expected in the survivors. [References: 32]

ORLIAGUET G.A., GUEUGNIAUD P.Y.
Non-invasive aortic blood flow measurement.
Curr. Opin. Anaesthesiol., 13 (3), 307-312, 2000
(Services cités : Anesthésie Pédiatrique)
Invasive monitoring is rarely used for children undergoing routine anaesthesia, whereas usual non-invasive haemodynamic measurements such as heart rate and blood pressure monitoring are unable to detect cardiovascular changes rapidly and precisely. In contrast, oesophageal aortic blood flow echo-Doppler is an easy, non-invasive and accurate method to monitor cardiac

performance properly and continuously. Therefore, it could represent a useful addition to peri-anaesthetic monitoring techniques, particularly in infants and small children.

1999

LABENNE M., POYART C., RAMBAUD C., GOLDFARB B., PRON B., JOUVET P., DELAMARE C., SEBAG G., HUBERT P.

Blind protected specimen brush and bronchoalveolar lavage in ventilated children.

Crit. Care Med., 27 (11), 2537-2543, 1999

(Services cités : Anatomo-Pathologie, Radiologie Pédiatrique, Biostatistique, Anesthésie Pédiatrique, Laboratoire de Microbiologie)

OBJECTIVE: To determine whether nonbronchoscopic protected specimen brush (PSB) and bronchoalveolar lavage (BAL) are contributive for diagnosing ventilator-associated pneumonia in mechanically ventilated children. DESIGN: Prospective study. SETTING: Fifteen-bed pediatric intensive care unit in a university hospital. PATIENTS: A total of 103 mechanically ventilated children, ranging in age from 7 days to 8.8 yrs, most with a high clinical suspicion for bacterial pneumonia. INTERVENTIONS: All the children underwent nonbronchoscopic PSB and BAL. Nonbronchoscopic PSB was performed with a plugged double-sheathed brush and BAL with a double-lumen plugged catheter. Endotracheal secretions and blood cultures were also collected. Open-lung biopsy was performed for any child who died within 7 days after the inclusion in the study, according to the parental consent. MEASUREMENTS AND MAIN RESULTS: The PSB specimens were submitted for bacteriologic quantitative culture (positive threshold, 10(3) colony-forming units [cfu]/mL). The BAL samples were processed for microscopic quantification of the polymorphonuclear cells containing intracellular bacteria (positive threshold, 1%) and quantitative culture (positive threshold, 10(4) cfu/mL). According to diagnostic categories based on clinical, biological, radiologic, and pathologic criteria, 29 children had bacterial pneumonia and 64 did not Ten children were classified as having an uncertain status. Of the 29 children with bacterial pneumonia, 26 (90%) met one of the following three criteria: a) PSB specimen culture, > or =10(3) cfu/mL; b) intracellular bacteria in cells retrieved by BAL, > or =1%; and c) BAL fluid culture, > or =10(4) cfu/mL. In contrast, 56 (88%) of the 64 patients without pneumonia did not. CONCLUSION: The results of this study indicate the following: a) nonbronchoscopic PSB and BAL were feasible in a large population of mechanically ventilated children; b) nonbronchoscopic techniques were contributive for diagnosing ventilator-associated pneumonia in children; and c) a combined diagnostic approach, using nonbronchoscopic PSB and BAL, was superior to using either test alone.

LACAILLE F., BELGHITI J., SAUVAT F., MICHEL J.L., FARGES O., RENGEVAL A., SARNACKI S., SAYEGH N., JAN D., REVILLON Y.

Liver transplantation with a living related donor in children.

Gastroentérol. Clin. Biol., 23 (6-7), 710-716, 1999

(Services cités : Département de Pédiatrie, Radiologie Pédiatrique, Anesthésie Pédiatrique, Chirurgie Pédiatrique)

Objectifs - Liver transplantation with living related donor has been recently developed to compensate for the insufficient number of liver grafts for children. The major problem is ethical because it implies voluntary mutilation of a healthy person This paper report results in 37 living related donors.

LANGERON O., COIRAULT C., FRATEA S., ORLIAGUET G., CORIAT P., RIOU B.
The effects of dantrolene on the contraction, relaxation, and energetics of the diaphragm muscle.
Anesth. Analg., 89 (2), 466-471, 1999
(Services cités : Anesthésie Pédiatrique)
Dantrolene is used in patients with muscle spasticity and is the only known effective treatment for malignant hyperthermia. However, its effects on muscle relaxation and energetics are unknown and may have important consequences in diaphragmatic function. We studied the effects of dantrolene (10(-8) to 10(-4) M) on diaphragm muscle strips (n = 12) in the hamster in vitro (Krebs-Henseleit solution, 29 degrees C, 95% oxygen/5% carbon dioxide) in response to tetanic stimulation (50 Hz). We studied contraction and relaxation under isotonic and isometric conditions, as well as energetics. Data are mean +/- so. Dantrolene induced a negative inotropic effect in the hamster diaphragm (active force at 10(-4) M: 34% +/- 7% of baseline; $P < 0.05$) but did not significantly modify the curvature of the force-velocity relationship. Dantrolene did not significantly modify isotonic relaxation. Dantrolene, up to 10(-5) M, did not significantly impair isometric relaxation. In conclusion, dantrolene induced a marked negative inotropic effect on diaphragm muscle without affecting myothermal efficiency and relaxation. Implications: Dantrolene induced a significant and concentration-dependent negative inotropic effect on diaphragm muscle but did not modify isotonic relaxation, which suggests no alteration of the calcium reuptake by the sarcoplasmic reticulum; up to 10-5 M dantrolene did not alter isometric relaxation, i.e., myofilament calcium sensitivity. Dantrolene did not modify the energetics of diaphragm muscle. [References: 26]

MEYER P., LEGROS C., ORLIAGUET G.
Critical care management of neurotrauma in children: new trends and perspectives.
Child Nerv. Syst., 15 (11-12), 732-739, 1999
(Services cités : Anesthésie Pédiatrique)
Secondary brain lesions resulting from cerebral metabolic and hemodynamic reactions can be prevented by neurocritical care management. It must be initiated as soon as possible, ideally in a prehospital setting. Tracheal intubation, controlled ventilation and hemodynamic stabilization are the prerequisites. Beside intracranial and cerebral perfusion pressure, monitoring must evaluate the coupling between cerebral metabolic demand and blood flow. Jugular bulb oximetry is the most reliable approach to global cerebral coupling. Transcranial Doppler evaluates cerebral blood flow indirectly and noninvasively. Technological developments have led to local metabolic evaluation that does not yet have any clinical relevance. Therapeutic developments are more a new approach to the use of old drugs. Controlled hyperventilation, mannitol and, more recently, hypertonic saline solutions, used for restoring cerebral metabolic coupling, are the foundations of treatment. Thiopental, revisited as a vasoconstrictive agent, the "Lund" vasoconstrictive approach with anti-hypertensive drugs and cerebral vasoconstrictors, must be further evaluated in children, as must therapeutic hypothermia. Finally, what we probably need for the immediate future is a noninvasive and easily reproducible method of monitoring cerebral metabolic coupling that will allow precise therapeutic adaptation of multimodal therapy to the individual needs of the child. [References: 42]

ORLIAGUET G., MAYER M.N.
Fiche Adarpef/Sfar. Medical information before anesthesia for your child.
Ann. Fr. Anesth. Réanim., 18 (9), FI120-FI121, 1999
(Services cités : Anesthésie Pédiatrique)