187 HYPOTHERMIA DECREASES INTRAPULMONARY SHUNT IN DOGS

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The effect of hypothermia on respiratory failure has not been studied. One possible advantage of hypothermia in respiratory failure is the reduction of cardiac output, which may in turn lower intrapulmonary shunting. We measured venous admixture and other cardiorespiratory variables in 5 anesthetized adult dogs before and after surface cooling to 30°C, and again after isovolemic hemodilution with Dextran 75. Arterial blood gases and hemoglobin saturations were corrected for temperature. Cardiac output was calculated from oxygen consumption, which was measured directly using a closed circuit method. Caridorespiratory variables measured at baseline (38°C), during hypothermia (30°C) and during hypothermia and hemodilution (30°C+H) are shown in the table below. ($\bar{x}$ ± SEM, *p<.05) Venous admixture fell dramatically in 4 out of 5 dogs (from .24 ± .05 to /08 ± .02, x SEM, p<.01).

	PaO2	ArtSat	MAP	MPAP	CI	SUR	PVR	Ova/Ot
38°C	81.6	.95	89	14	7.16	1035	107	.26
	+2.9	+.01	+5	+2	+0.98	+233	+46	+.04
30°C	85.8	.98	98	15	4.45	2111	159	.15
	+11.0	+.02*	+5	+2	+0.74*	+356*	+19	+.06
30°C+H	67.4	.94	67	12	7.01	926	121	.21
	+10.1	+.04	+15	+2	+1.65	+233	+57	+.06

Hypothermia decreases intrapulmonary shunt in dogs and may be useful in patients with respiratory failure.

188 DIC SCORE PREDICTS SURVIVAL IN HEAD TRAUMA CHILDREN.

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Of 2032 patients with head trauma, we evaluated a subgroup of 239 ages 0-16 (x = 9) yrs for disseminated intravascular coagulation (DIC). Auto accidents accounted for 57%, falls for 20%. Mortality was 15.1%. On initial motor score ~ 40% were nl, and 35% were in deep coma. The following DIC tests were performed on arrival: fibrinogen (ϕ), platelet count (PC), fibrin split products (FSP), thrombin time (TT), prothrombin time (PT), partial thromboplastin time (PTT). The table shows the % of test results in each of four severity groups, 0-3:

	0 (NL)	1	2	3 (Severely abnl)
PC	95	2.9	0.4	1.3
FSP	29.3	33.9	11.7	25.1
ϕ	61.5	22.2	10.0	6.3
TT	56.9	16.3	8.8	18.0
PT	80.8	12.6	4.4	2.5
PTT	79.5	8.8	6.3	5.5

DIC score of 0-18 is obtained by summing the individual scores defined above. The mean DIC score for the group was 4.1. Abnormalities in FSP and PTT were most predictive of non-survival, predicting with logistic regression analysis correct outcome 90.4% of the time, compared to the motor score of 89%. This was superior to the coma score. With both motor and DIC scores 94.6% predictiveness was achieved. This evaluation scheme may identify candidates for early therapeutic intervention of the DIC that adversely affects their survival.

189 METABOLIC ACIDOSIS, HYPERGLYCEMIA, AND KETONURIA IN CARBAMAZEPINE OVERDOSE.

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Certain drugs may produce hyperglycemia by decreasing pancreatic secretion of insulin. We report a case of accidental carbamazepine overdose in a previously healthy three year old black male who presented in an unconscious state without seizures with an arterial pH of 7.28, serum glucose of 210 mg/dl, and urine glucose and ketones of 3+ and 2+, respectively. Arterial blood gases showed a pure metabolic acidosis. A diagnosis of diabetic ketoacidosis was made; the patient was given insulin, sodium bicarbonate, and intravenous hydration. Subsequent history revealed that the patient ingested an unknown amount of carbamazepine. A toxic serum carbamazepine level of 22 mcg/ml (therapeutic = 6 to 10) was found. The patient was treated with activated charcoal and general supportive care. Complete symptomatic recovery occurred by the end of 48 hours and follow up laboratory studies failed to show any evidence of hyperglycemia, ketonuria, or glycosuria.

This case demonstrates a previously unreported manifestation of carbamazepine overdose in a child, i.e., metabolic acidosis, hyperglycemia and ketonuria. Carbamazepine in high dose is known to produce hyperglycemia in rats possibly by decreasing the sodium influx needed for insulin secretion (Pharmacology 24:123, 1982). We conclude that metabolic acidosis due to carbamazepine overdose should be considered in the differential diagnosis of altered metabolic states and drug overdose.

190 NO BURNS, NO GRADIENT - PULSE OXIMETRY, AN ALTERNATIVE TO TRANSCUTANEOUS PO_2.

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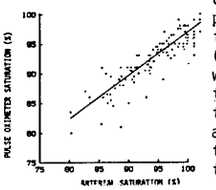
Continuous monitoring of oxygenation in sick newborns is essential. However, transcutaneous PO_2 ($tcPO_2$) measurements have limitations. The extremely immature infant cannot tolerate a heated electrode. Older infants, and infants with BPD have large and unpredictable skin-arterial gradients. We report pulse oximetry as a technique for continuous, non-invasive measurement of arterial oxygen saturation (SaO_2). We studied 20 infants, gestational ages 28-40 weeks, ages 1-49 days. Fetal hemoglobin (Hb) determinations were made on all infants and ranged from 5-100%. SaO_2 readings from the Nellcor Pulse Oximeter were compared to the SaO_2 measured with an IL282 CO-Oximeter on simultaneously obtained arterial blood samples. The method of Cornellisen (Clin. Chem., 1983) was used to correct for the fictitiously elevated carboxyhemoglobin levels caused by the presence of fetal Hb. The figure shows the close correlation for the 121 samples (Y=24.45+0.72X, r=.89.). The correlation was equally good for the 3 infants greater than 1 month of age with BPD. We conclude that the pulse oximeter provides an accurate, non-invasive alternative to $tcPO_2$ monitoring, and overcomes some of the limitations previously encountered.



191 CENTRAL VENOUS CATHETER INSERTION VIA FEMORAL VEIN BY PEDIATRIC RESIDENTS: A SAFE AND EFFECTIVE TECHNIQUE

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Success in teaching pediatric residents (PRs) to insert central venous catheters (CVCs) for hemodynamic monitoring has not been evaluated previously. Surveillance was carried out for CVCs inserted by PRs under the supervision of ICU attendings or chief residents, using the percutaneous Seldinger technique via the femoral vein. Insertion by PRs or ICU staff was successful in 21 of 23 (91%) consecutive patients attempted. Success was achieved in a single attempt in 13 of 21 cases; the others required 3-8 attempts. In successful cases, insertions required ≤5 minutes in 12 of 20 (60%) for whom time was recorded. Patients <10kg had prolonged (>5 minutes) or unsuccessful attempts (6 of 8) more often than patients >10kg (4 of 14) (p=.048). PRs were successful in 14 of 21 (67%) patients attempted, and were successful at the first insertion attempt in 12 of 21 (57%). Most of the PRs (15 of 18) had previously inserted fewer than 5 CVCs each. The only significant complication, arterial puncture in 2 of 23 (9%), was not associated with sequela. Minor complications included mild local bleeding (3), transient pallor of leg (1), catheter looped in vena cava (easily repositioned) (1), and thrombi adhering to the catheter at post mortem exam (2). Clinical evidence of venous obstruction was not observed. CVC insertion by femoral vein is a safe and effective procedure. Instruction in this procedure should be included in pediatric advanced life support training for pediatric residents.

192 PROLONGED MECHANICAL VENTILATION OF INFANTS AFTER OPEN HEART SURGERY

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Records of all 140 infants <2 years undergoing open heart surgery 7/80-9/84 were studied to evaluate the relationship between duration of mechanical ventilation (MV) and mortality, and risk factors for prolonged MV. MV was required for: 0-1 day (84), 2-6 days (37), ≥7 days (19). The 16% mortality in those with MV ≥7 days did not exceed that in infants with briefer MV (17%). Factors which prolong MV include: younger age (p<.005) (mean 10 mo), longer bypass time (p<.005) (mean 105 min), longer aortic cross clamp time (p<.01) (mean 51 min), and pre-op MV (p<.05). A predictive index (PI) for each patient was derived by assigning a +1 score for each factor when its value was worse than the mean. PI ≥2 predicted prolonged MV ≥7 days with 95% sensitivity and 57% specificity. MV ≥7 days occurred in 26% of infants with PI ≥2 and only in 1% with PI <2. Post-op factors including premature extubation requiring reintubation (p<.005) and requirement for a second surgical procedure (p<.005) also lengthened MV. The R^2=.57 for combined significant variables in relation to duration of MV. While not predictive for the entire population, among the 19 requiring MV ≥7 days, 14 had pre-op elevation of pulmonary artery pressure, resistance, or blood flow, or high left atrial pressure. For patients predicted to have high risk of prolonged MV, early nutritional support, heightened vigilance for treatable complications and nosocomial infections, and avoidance of futile premature extubation are all suggested.