Title: **Noncognitive Variables: Primary Determinants of Clinical Performance and Precursors of Critical Incidents in Five Anesthesiology Training Programs**

Authors: **M. F. Rhoton, Ph.D.**, A. Barnes, M.D., M. Flashburg, M.D., A. Ronai, M.D., S. Springman, M.D.

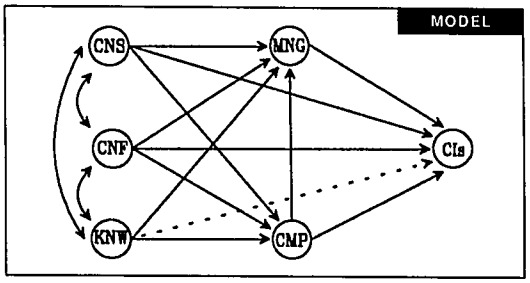
Affiliation: CWRU Medical School and University Hospitals; The Cleveland Clinic Foundation; Monmouth Medical Center; Northwestern University; University of Wisconsin at Madison

Introduction. There is evidence to suggest that performance in noncognitive areas provides information that is independent of cognitive results and important in understanding and predicting clinical performance.[1-4] The ABA has also emphasized noncognitive aspects (motivation, interpersonal skills and values) of performance.[5]

Method. In 1987, we began a study of clinical performance in 5 departments (5-D) using a daily Clinical Anesthesia System of Evaluation (CASE).[6] Some of these studies were designed to: (1) identify variables which were determinants of overall performance, (2) determine the influence of noncognitive variables on overall performance, and (3) assess relationships between noncognitive performance and Critical Incident scores (CIs). Negative comments made about residents in training from 1987-1989 in 5-D were used for analysis.[6] A stepwise multiple regression analysis (SPSS; PIN = .05; POUT = 0.1; Tolerance = .01) was used to determine the extent to which CASE scores in individual categories could be used to predict overall performance after 24 months of training. We then examined the effect of noncognitive predictors from the first analysis on total performance and CIs. Path analysis was used [7,8] to assess cause and effect relationships between the predictive categories and CIs.

Results. During 24 months, 9,146 comments were made about 45 residents by 163 faculty; 2,689 were negative. Results are based on 37 residents for whom data were complete. The top 5 predictors of overall performance were: Conscientiousness (CNS), Management (MNG), Confidence (CNF), CIs, Clinical Knowledge (CKNOW). Respective R2 = .7480; .9208; .9608; .9712; .9790. CNS accounts for almost 3/4 of the variability in total scores. The top 3 predictors of CIs were: CNS, Composure (CMP), MNG. Respective R2 = .4789; .6612; .7257. CNS and CMP account for 2/3 of the variability in CIS scores ($p < .0005$ for both analyses). The model below was proposed to define the cause and effect relationships between the predictor categories and CIs. Viability of the model was tested and confirmed by path analysis.

Discussion. Our findings indicate that inadequate performance in the noncognitive categories (1) accounts for most of the variability in overall performance, and (2) plays a crucial role as a precursor of CIs. If these results are valid, satisfactory performance in these areas represents the foundation on which acceptable and safe levels of clinical performance are built.



References.
1. J Med Educ 54:759-65, 1979.
2. J Med Educ 53:812-15, 1975.
3. J Med Educ 53:711-19, 1978.
4. J Med Educ 50:812-15, 1975.
5. ABA Communique to Residency Directors & Clinical Compentency Committees re: Defining competence in anesthesiology; Sept. 89.
6. Rhoton MF: A new method for evaluating clinical competence & documenting critical incidents. Med Educ, Blackwell Scientific Pubs. (in press).
7. Sociological Methods & Research 9(1):3-28, 1980
8. Pedhazur EJ: Multiple regression in behavioral research (2nd Ed.):577-635; Holt, Rinehart & Winston, 1982.

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TITLE: RECOVERY ROOM MORBIDITY AND MORTALITY ASSOCIATED WITH RENAL EXTRACORPOREAL SHOCK WAVE LITHOTRIPSY (ESWL)

AUTHORS: A.L. Kovac, M.D., J.V. Mangold, M.D.
AFFILIATION: Anes. Dept., University of Kansas Kansas City, Kansas 66103

ESWL and anesthesia techniques used for ESWL have undergone significant changes since its inception in 1980. New generation and modified older waterbath machines reportedly deliver less power and are amenable to monitored anesthesia care (MAC)(1). Our purpose was to determine and compare types of complications noted in the post anesthesia recovery room (PAR) associated with different anesthetic techniques (general (GEN), spinal, epidural, or MAC) used for both the older Dornier HM3 (HM3) (Dornier Medical Systems, Inc., Marietta, GA) and new modified Dornier (MODHM3) ESWL machines.

Following Human Subjects Committee approval, 2185 patients were retrospectively reviewed for complications in the PAR associated with different anesthetic techniques over a 32 month period. A positive finding was a note or treatment order in the PAR record. Anesthesia consisted of GEN (N20/02, Forane, Fentanyl, Vecuronium), spinal (tetracaine or marcaine), epidural (lidocaine or marcaine) or MAC (fentanyl and midazolam).

2185 patients (female 46%, male 54%) with a mean age of 48 years, mean weight of 68 kg and mean height of 157 cm received 2271 ESWL treatments. ASA Class were I (29%), II (55.3%), III (15%), and IV (0.5%). 2160 treatments were performed on a HM3 and 111 of 127 MAC cases on a MODHM3 ESWL machine. 16 MAC cases were administered with the HM3 on patients with spinal cord injury, resulting in 4 cases of autonomic hyperreflexia. (Table)

ESWL overall is relatively safe. Main complications in PAR were nausea ± vomiting, flank pain, and hypertension. A higher percentage of patients experienced nausea ± vomiting, flank pain, and hypertension with MAC on MODHM3 than GEN, spinal or epidural on HM3. While MAC anesthesia may appear more safe and simple, patients still have potential for morbidity, especially when a fentanyl and midazolam bolus technique is used.

1. N Engl J Med 320 (7):393-397, 1988.

TABLE

ESWL COMPLICATIONS IN PAR

	GENERAL (HM3) n=1919	SPINAL (HM3) n=187	EPIDURAL (HM3) n=38	MAC (HM3) n=16	MAC (MODHM3) n=111	GRAND TOTAL n=2271
	(%)	(%)	(%)	(%)	(%)	(%)
NAUSEA +/- VOMITING	109 (5.7)	---	---	---	8 (7.2)	117 (6.1)
FLANK PAIN	45 (2.3)	3 (1.6)	---	---	17 (15.3)	65 (3.4)
HYPERTENSION	42 (2.2)	4 (2.1)	1 (2.6)	4 (25.0)	5 (4.5)	57 (3.0)
HYPOTENSION	5 (0.3)	---	---	---	---	5 (0.23)
HYPOTHERMIA	2 (0.1)	---	---	---	---	2 (0.09)
AUTONOMIC HYPERREFLEXIA	1 (0.05)	---	---	4 (25.0)	---	5 (0.22)
ANGINA	5 (0.3)	2 (1.1)	---	---	---	7 (0.4)
MI	---	1 (0.5)	---	---	---	1 (0.04)
CVA	---	1 (0.5)	---	---	---	1 (0.04)
DEATH	1 (0.05)	---	---	---	---	1 (0.04)