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DEPARTMENT OF ANESTHESIOLOGY AND INTENSIVE CARE;
ALL-RUSSIAN CENTRE OF FUNCTIONAL SURGICAL GASTROENTEROLOGY

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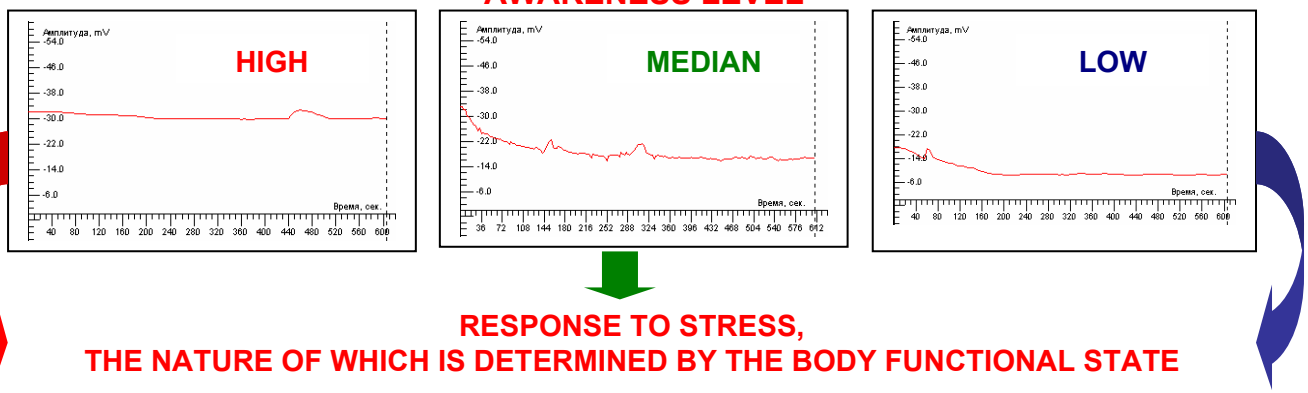
PREVENTIVE INTENSIVE CARE OF CRITICAL STATES

The aim of the technique is to individualize intensive care by predicting a postoperative course of the disease and administration of preventive therapy for critical states. The technique is based of recording of ultraslow physiological processes using a method of omegametry with determination of **awakeness level**. Depending on the omegametry findings, intensive care is based on the individualized body response to the stress-factor, which are defined by the functional state.

AGGRESSIVE FACTOR AS A CAUSE OF DEVELOPMENT OF CRITICAL STATE

AWAKENESS LEVEL



RESPONSE TO STRESS,
THE NATURE OF WHICH IS DETERMINED BY THE BODY FUNCTIONAL STATE

AWAKENESS LEVEL

- CURRENT PHYSIOLOGICAL ACTIVITY OF BRAIN SYSTEMS THAT ENSURES SIMPLE AND COMPLEX TYPE OF ACTIVITY (ILYUKHINA V.A., 1982).
- THE LEVEL OF ACTIVITY OF NERVOUS CENTERS UNDERLYING REALIZATION OF SPECIFIC FUNCTIONS (DANILOVA N.N., 1985).
- **OMEGA-POTENTIAL** VALUE IN A FOREHEAD-THENAR REFERENCE IS AN ELECTROPHYSIOLOGICAL CORRELATE REFLECTING THE TOTAL POLARIZATION OF BRAIN NEURONS.

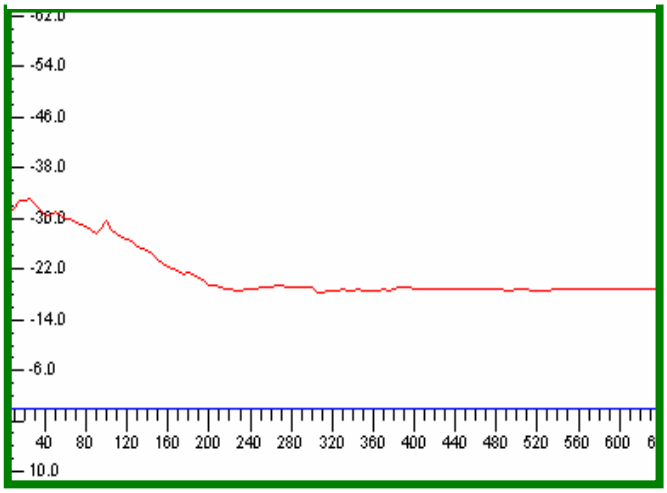
REGISTRATION AND ANALYSIS OF ULTRASLOW (<0.5 HZ) BIOPOTENTIALS (mV)

SAFE EXPRESS-ASSESSMENT AND MONITORING OF STRESS-STABILITY BY THE ELECTROPHYSIOLOGICAL CORRELATES:

- AWAKENESS LEVEL
- PSYCHOEMOTIONAL STATE
- CHARACTER OF ENERGY EXCHANGE
- REACTIVITY OF REFLEX REGULATION OF THE CARDIOVASCULAR AND RESPIRATORY SYSTEMS
- QUALITY OF NEUROHUMORAL REGULATION OF VISCERAL FUNCTIONS

FUNCTIONAL STATE AT OPTIMAL AWAKENESS LEVEL

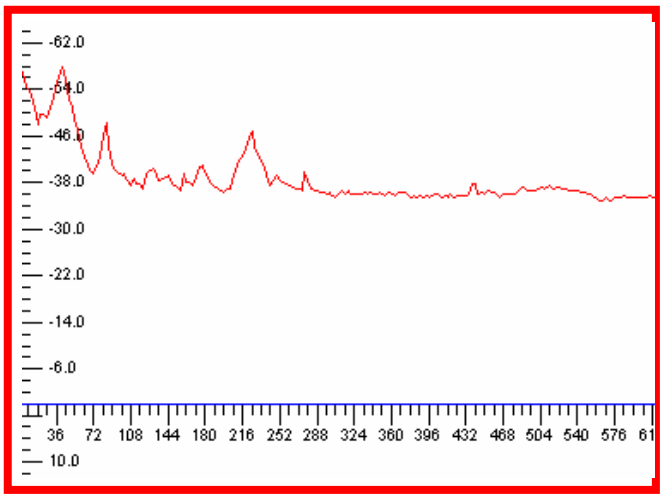
OMEGA-POTENTIAL (-15) – (-25), mV



- BALANCE BETWEEN EXCITATION AND INHIBITION PROCESSES IN THE CENTRAL NERVOUS SYSTEM IN OPTIMAL STATE OF REGULATORY CENTERS.
- ADEQUATE (OPTIMAL FOR CURRENT STATE) REACTIONS FOR ANY TYPE OF ENDOGENOUS AND EXOGENOUS INFLUENCES.
- STABLE PSYCHOEMOTIONAL CONDITION.
- COMPENSATED CONDITION OF TRANSCAPILLARY EXCHANGE.

FUNCTIONAL STATE AT HIGH AWAKENESS LEVEL

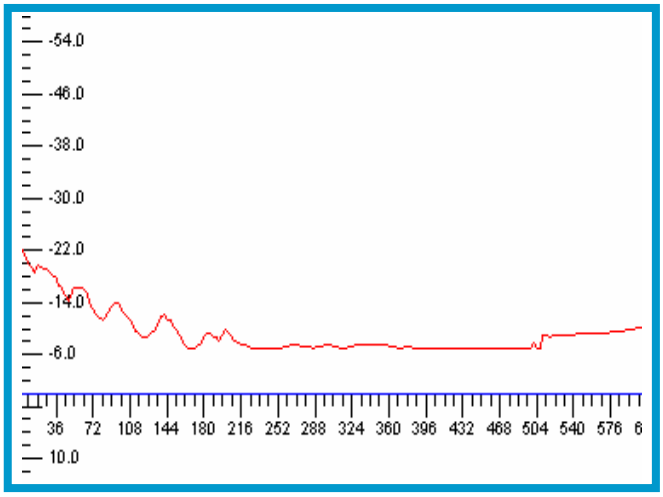
OMEGA-POTENTIAL -26 – (-80), mV



- PREVALENCE OF EXCITATORY PROCESSES IN THE CENTRAL NERVOUS SYSTEM DUE TO ACTIVATION OF RETICULAR FORMATION.
- PARADOXICAL, INCLUDING LINGERING, REACTIONS ON STRESS-IMPACT.
- PSYCHOEMOTIONAL EXCITATION RIGHT UP TO TEMPORARY INSANITY.
- HYPERDYNAMIC HYPERTONIC CIRCULATION WITH CIRCULATORY HYPOXIA DEVELOPMENT.
- BRAIN AND PERIPHERAL TISSUES DEHYDRATION.

FUNCTIONAL STATE AT LOW AWAKENESS LEVEL

OMEGA-POTENTIAL +20 – (-14) mV



- PREVALENCE OF INHIBITORY PROCESSES IN THE CENTRAL NERVOUS SYSTEM DUE TO INHIBITION OF RETICULAR FORMATION.
- FAST EXHAUSTION OF PSYCHIC AND PHYSIOLOGIC FUNCTIONS REGULATION.
- LIMITATION OF FUNCTIONAL ADAPTIVE RESERVES AND NON-SPECIFIC RESISTANCE.
- HYPOKINETIC CIRCULATION, VASCULAR TONE REGULATION DISTURBANCES.
- HYPERHYDRATION OF PERIPHERAL TISSUES AND BRAIN.

ALGORITHM OF PREVENTIVE INTENSIVE CARE

Patent RF № 2146491, 2000; № 2149580, 2000; №2186521, 2002

OMEGA – 4

RESOURSES IN ANESTHESIOLOGY AND INTENSIVE CARE

- ASSESSMENT OF ANXIETY DEGREE
- INDIVIDUALIZATION OF PREMEDICATION AND ASSESSMENT OF ITS EFFICACY
- CHOICE OF ANESTHESIA TECHNIQUE
- PREDICTION OF COURSE AND ADEQUACY OF ANESTHESIA
- PREDICTION AND PREVENTION OF POSTOPERATIVE COMPLICATIONS
- CHOICE OF A TECHNIQUE AND ASSESSMENT OF AN EFFERENT THERAPY EFFICACY

DISTINCTIVE FEATURES OF FUNCTIONAL STATE AT HIGH AND LOW AWAKENESS LEVEL APPEAR TO BE THE RISK FACTORS FOR TYPICAL COMPLICATIONS

LOW AWAKENESS LEVEL

↓

INFLAMMATORY AND SEPTIC COMPLICATIONS

DUE TO LOW NON-SPECIFIC RESISTANCE, WITH A TENDENCY TO PERIPHERAL TISSUE HYPERHYDRATION

HIGH AWAKENESS LEVEL

↓

HEMODYNAMIC, INCLUDING THROMBOGENIC COMPLICATIONS

DUE TO PREVALENCE OF STRESS-REALIZING SYSTEMS, PSYCHOEMOTIONAL STRESS, CIRCULATORY HYPOXIA AND DEHYDRATION OF TISSUE

At the ***optimal awakeness level*** and predicting of a low risk of complications a basic therapy is performed (pain management, correction of fluid-and-electrolyte balance, protein loss, reology and hemocoagulation, parenteral / early enteral nutrition, antibacterial therapy, prevention of aggravation of concomitant pathologies).

When we reveal a ***low level of awakeness***, we accentuate our treatment on prevention of inflammatory and septic complications that demands an improvement of nonspecific resistance of the body, inotropic support, lymphostimulation, elimination of hypoxia, organoprotection besides the basic therapy.

At the presence of a ***high level of awakeness*** the basic therapy is supplemented by the prophylaxis of hemodynamic and thrombogenic complications that needs sedation, neurovisceral blockade, normalization of the peripheral hemodynamics.

The main distinction and advantage of the proposed technique is its ability to predict and purposefully treat complications in a specific patient. This technique is cost effective and it improves the intensive care efficiency.

BASIC INTENSIVE THERAPY

OPTIMAL AWAKENESS LEVEL

1. PAIN MANAGEMENT
2. CORRECTION OF ELECTROLYTE DISORDERS, PROTEINE LOSSES, RHEOLOGY AND HAEMOCOAGULATION (HEPARIN)
3. PARENTERAL / EARLY ENTERAL NUTRITION
4. ANTIBACTERIAL PROPHYLAXIS
5. PREVENTION OF EXACERBATION OF CONCOMITANT DISEASES

SUPPLEMENTARY INTENSIVE CARE IN RISK GROUPS

LOW AND HIGH AWAKENESS LEVEL

1. ANTIBIOTIC MANAGEMENT.
2. ANTI-NOCICEPTIVE SYSTEM ACTIVATION (DALARGIN).
3. REDUCTION OF NEGATIVE EFFECTS OF HYPOXIA, ISCHEMIA AND REPERFUSION SYNDROME.
4. ANTICOAGULANTS (LOW-WEIGHT HEPARIN ENOXAPARIN).
5. PROTEOLYSIS INHIBITORS AND MEMBRANE STABILIZERS IN MARKED ACTIVATION OF FIBRINOLYSIS.

DISTINCTIVE FEATURES OF SUPPLEMENTARY INTENSIVE CARE IN RISK GROUP DEPENDING ON AWAKENESS LEVEL

LOW

CENTRAL NERVOUS SYSTEM ACTIVATION AND/OR ELIMINATION OF HYPERHYDRATION

1. NON-SPECIFIC RESISTENCE STIMULATION (INCLUDE CNS)
2. LYMPHOSTIMULATION
3. INOTROPIC SUPPORT (ON DEMAND)
4. PROLONGED RESPIRATORY SUPPORT (ON DEMAND)

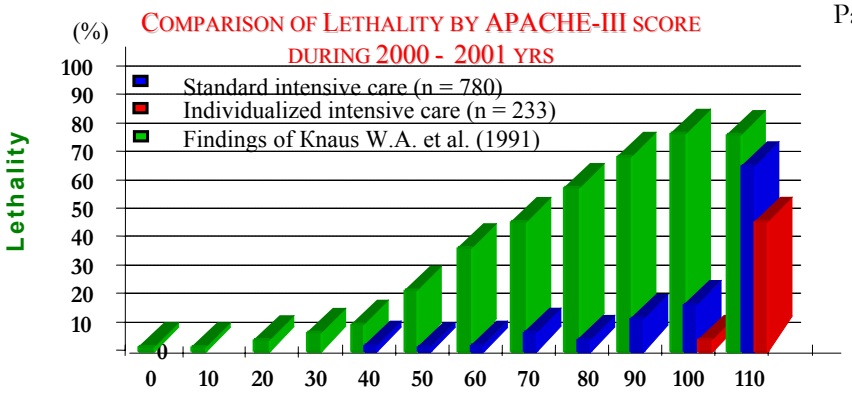
HIGH

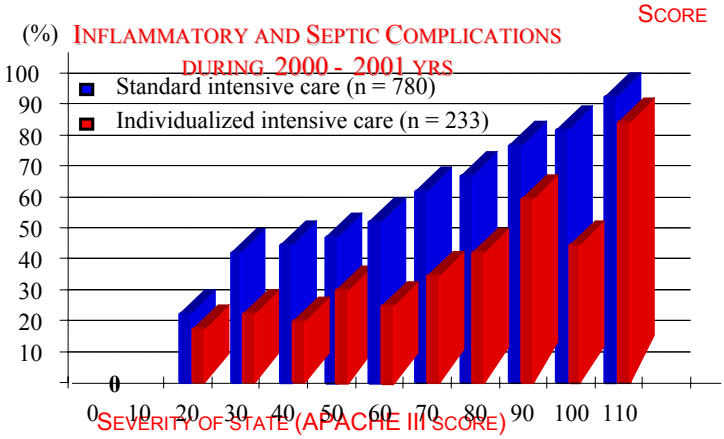
CENTRAL NERVOUS SYSTEM ACTIVATION AND/OR ELIMINATION OF DEHYDRATION

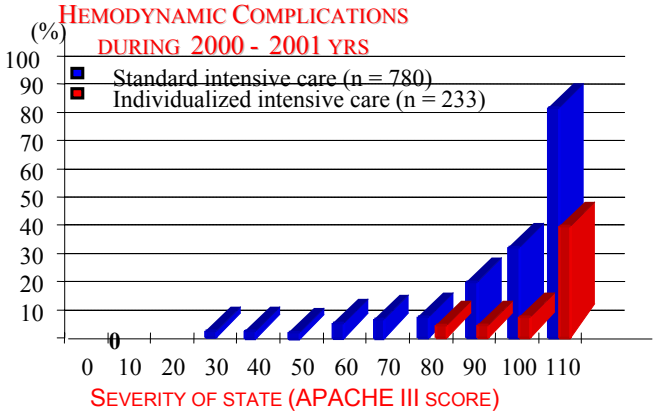
1. INCREASE OF INFUSION VOLUME
2. SEDATION AND COMBINED NEUROVISCERAL INHIBITION
3. RELEASE OF VASCULAR SPASM
4. PROPHYLAXIS AND TREATMENT OF SECONDARY INFLAMMATORY AND SEPTIC COMPLICATIONS.
5. PROPHYLAXIS OF A PULMONARY EMBOLI

RESULTS OF POSTOPERATIVE INTENSIVE CARE OPTIMIZATION

Patent RF № 2162329, 2001







CONCLUSIONS:

1. DEVELOPED AND INTRODUCED INTENSIVE CARE TECHNIQUES ALLOW US TO REDUCE THE RATE OF INFLAMMATORY, SEPTIC AND HEMODYNAMIC COMPLICATIONS IN PATIENTS UNDERGONE LONG-LASTING TRAUMATIC GASTROINTESTINAL OPERATIONS.
2. THE ADMINISTRATION OF OMEGAMETRY TECHNIQUE IN EARLY POSTOPERATIVE PERIOD CAN REDUCE 4.5 TIMES THE LETHALITY RATE IN PATIENTS WITH A HIGH RISK OF IN-HOSPITAL DEATH AFTER GASTROINTESTINAL OPERATIONS.