

Pediatric Tick Borne Disease

Evaluation and Management

Ann F Corson MD

June 25, 2009

Ticks are cesspools of disease

- *Borrelia burgdorferi* (300+ strains worldwide, 100 in US)
- Other *Borrelia* species (*lonestari*, *garinii, afzelii*, others?)
- *Babesia microti, B duncani* (*B divergens,* others?)
- *Ehrlichia chaffeensis* - Human Monocytic Ehrlichia (HME)
- *Anaplasma phagocytophilum* - Human Granulocytic Anaplasmosis (HGA) (*A phago* Variant-1 in Chester Co?)
- *Bartonella henselae* (*B quintana*, others?)
- *Mycoplasma fermentans* (Gulf War Syndrome, others)
- *Rickettsia rickettsia* - Rocky Mountain Spotted Fever (RMSF) (other Spotted Fever/Typhus Fever Group *Rickettsia*)
- *Coxiella burnetii* - Q fever
- *Francisella tularensis* - Tularemia
- Viruses (HHV-6) and Nematodes? (other parasites?)

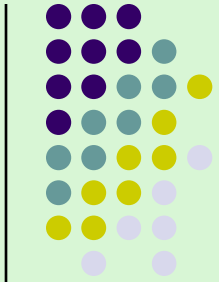
Tick bites

Tick bites

Pavan WO. Local epidemiology and clinical manifestations of Lyme disease. *Int J Med Sci* 2009; 6:123 http://www.medsci.org/v06p0123.htm

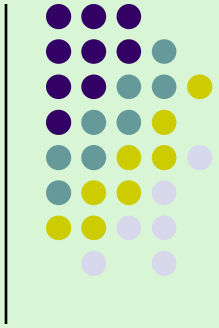
Tick bites

Approach to TBD patient



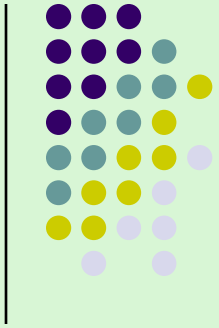
- Evaluation
  - History
    - Risk factors for TBD
    - Complete medical history
    - Social and family history
  - Physical exam
  - Laboratory evaluation
    - TBD labs
    - Full medical work up
    - Imaging as indicated

Approach to TBD patient



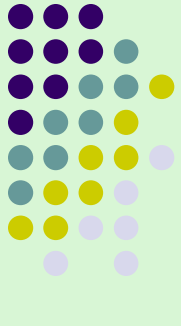
- Management
  - Tick avoidance
  - Diet
  - Environment
    - Mold remediation, EMFs
  - German Biological Model Homotoxicology
    - Immune modulation, drainage and regulation
  - Allopathic, homeopathic and herbal antimicrobials
  - Referrals, as needed
    - Osteopathy, acupuncture, chiropractic neurology, chiropractic, psychological counseling

Evaluation



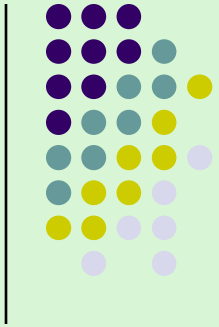
- History
  - Risk factors
    - Known tick attachments, rash, live in endemic area, reservoir animals (deer, mice, others) in yard, travel exposure to tick infested areas, family members and/or household pets with TBD, mother's risk factors before and during pregnancy, ongoing tick exposure
  - Past medical history
    - Maternal health at time of conception
    - Complications of pregnancy

Evaluation



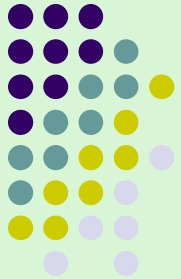
- Past medical history, continued
  - Birth history: e.g. length of term, SVD, C-Sec, forceps, delivery complications, meconium staining, Apgars, congenital abnormalities
  - Neonatal course: e.g. blood sugar control, body temperature control, hyperbilirubinemia, sucking difficulties, immunization history, tick bites/exposure?
  - Infancy: breast or bottle fed, sleeping problems, colic, reflux, stooling pattern, frequent infections, trauma, developmental milestones, immunization history, tick bites/exposure?

Evaluation



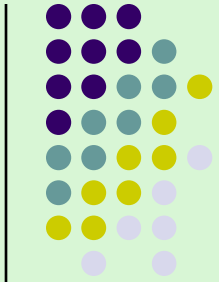
- Past medical history, continued
  - Toddler to school age: illnesses, trauma, sleep problems, developmental delays, socialization, play behavior, GI issues, food intolerances, environmental exposures, dental problems, immunization history, tick bites/exposure?
  - Elementary school: illnesses, trauma, sleep issues, social behavior in school, learning problems, orthodontic issues, neuropsychiatric symptoms or personality changes, medication reactions, environmental exposures, tick bites/exposure?

Evaluation



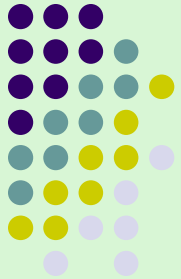
- Past surgical history
- Trauma history
  - Even head injuries without serious sequelae are important
- Social history
  - Dietary history
  - Family dynamics/psychological traumas
  - Wet basement, water intrusion home/school/day care
  - Presence of EMFs in home/school/day care
- Family history

Evaluation



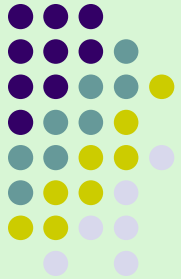
- History of present illness
  - Why do parents think child is sick?
  - Chronology of illness
- Review of systems
  - General: fevers, day or night sweats, cold hands and/or feet (dry or clammy), weight gain or loss
  - CNS: meeting expected developmental milestones in gross and fine motor development, language delay, processing speeds, attention, working memory, dyslexia, cranial neuropathies esp. ophthalmologic abnormalities

Evaluation



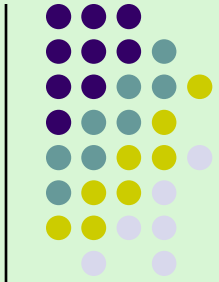
- Review of systems, continued
  - HA: frequency, duration, location, time of day, intensity
  - Balance
  - PNS: numbness, tingling, itching, stinging, stabbing, burning, sharp stabbing shooting pains, bug crawling feelings; sensory hypersensitivity to noise, light, odors, touch; painful radiculopathies
    - Infants not wanting to be held or to be soothed
    - Cutting tags out of clothing
    - Not wanting hair washed (scalp sensitive)
    - Overwhelmed in high sensory input environments

Evaluation



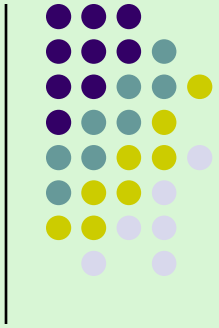
- Review of systems, continued
  - HEENT:
    - Scalp tenderness, lesions (pimples), sore spots
    - Ear pain, red pinnae (esp. in afternoon), tinnitus (“crickets”), hearing problems
    - Eye redness, itching, burning, tearing, discharge, tracking problems, lazy eye, strabismus, ptosis, visual changes, floaters, photophobia, red rimmed lids
    - Sinus congestion, runny nose, chronic or intermittent, post nasal drip, sneezing, worse after eating, upon awakening, environmental?

Evaluation



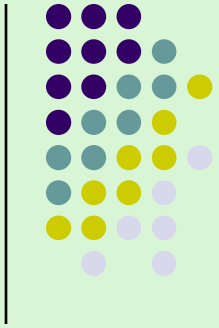
- Review of systems, continued
  - Oral sores (fever blisters or canker sores), tongue soreness
  - Teeth sensitivity, enamel problems, cavities
  - Taste or smell changes
  - Sore throats that are chronic, cyclical, intermittent
  - Hoarseness
  - Swallowing difficulties
  - Cervical, axillary or inguinal lymphadenopathy
- Neck: stiff or sore, crick, or crack or creak, range of motion

Evaluation



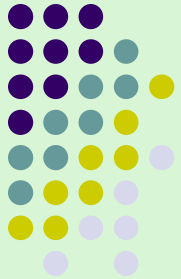
- Review of systems, continued
  - Lungs: shortness of breath, air hunger, does child sigh frequently, cough (day or night, dry or wet, cyclic)
  - Cardiac: palpitations (skipping or racing), chest pains, chest wall, rib or costal margin pains
  - Abdomen:
    - appetite, food preferences/cravings
    - nausea, reflux, heartburn
    - gas, belching, bloating, cramping
    - abdominal pain, location, intensity, frequency, triggering factors

Evaluation



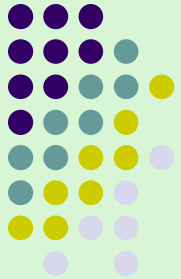
- Review of systems, continued
  - Stool color (brown, tan, green, black), frequency, consistency (dry, moist, mushy, runny), variability, straining at stool, hemorrhoids, rectal bleeding, mucus in stool, odor of stool and gas
  - Genitourinary: delayed toilet training, return of enuresis, loss of daytime bladder control, dysuria, nocturia, bladder pain, hesitancy, urgency, frequency, incomplete emptying, pelvic, genital or testicular pain
  - Skin: neonatal acne, eczema, seborrhea, birth marks (hemangiomas), recalcitrant diaper rashes, skin rashes of all kinds, EM rashes, red macule at nape of neck (stork bite)

Evaluation



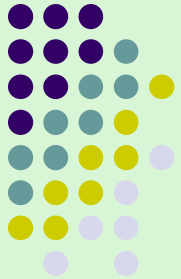
- Review of systems, continued
  - Joints: stiffness, crick, crack, or pop, pain is characteristically intermittent, migratory and cyclical, worse with exercise (other precipitating factors?)
  - Muscles: hypotonia, pain, spasms, cramping, morning foot pain on first weight bearing, morning body stiffness, twitches, effect of exercise
  - Energy: prefer sedentary or active play
  - Stamina: requires rest after school or play
  - Sleep: trouble falling asleep, staying asleep, frequent awakenings (what time?), nightmares, night terrors, sleepwalking, trouble getting up in morning

Evaluation



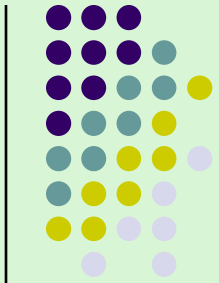
- Review of systems, continued
  - Psychiatric: irritability, mood swings, increased emotionality, tantrums, anger or rage attacks, frustration intolerance, physical aggressiveness, return of separation anxiety, new anxiety, panic attacks, phobias, depression with or without suicidal ideation, OCD, personality changes
  - Neurologic: tics, seizures, hypotonia, motor or sensory abnormalities, ataxia, neuropathy, neuralgia, vertigo, motion sickness
  - Exercise: aerobic exercise tolerance

Evaluation



- Physical examination
  - Vital signs: variable, but usually normal
  - HEENT:
    - Tongue size, color, coating, edges, sublingual veins
    - Pharynx red crescents, tonsils
    - Teeth and gum condition, halitosis
    - Ears (external and middle), Eyes (conjunctiva, lids)
  - Neck
    - Range of motion, forward head posture
    - Thyroid gland, cervical axillary and inguinal lymph nodes

Evaluation

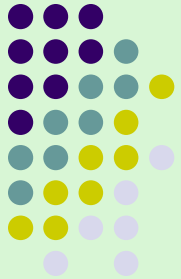


- Physical examination, continued
  - Lungs
    - Chest wall excursion, adventitial sounds
  - Heart
    - Murmurs, rhythm
    - Peripheral pulses
  - Abdomen
    - Costal margins, periumbilical region, organomegaly, palpable tenderness
  - Joints
    - Boggy synovium, sensitivity, ROM
    - Tenderness approx 4-5 inches up from the inner malleolus

Lyme synovitis

Lyme synovitis

Evaluation



- Physical examination, continued
  - Musculoskeletal
    - Soreness suboccipital, cervicothoracic junction, erector spinae, SI joints, trigger points, anterior shins, tensor fascia latae, muscle twitches or fasciculations
  - Skin - be sure to LOOK!
    - Hands and feet: temperature, clammy, sweaty
    - Scalp, finger and toe nails, peri-anal area
    - Hemangiomas (multiple in gestational cases)
    - All kinds of rashes
      - Erythema migrans rashes
      - Bartonella rashes/striae

Lyme rashes

http://notes-from-offcenter.com/2007/10/16/lyme-disease/

Lyme rashes

Lyme rashes

Photo credit: Edwin Masters, MD and Lyme Disease Association, Inc.

Bartonella rashes

Linear rashes on flank - look like stretch marks

Clinically associated with gastritis

Photos credit: Martin Fried, MD and The Lyme Disease Association, Inc.

Bartonella rashes

Back of legs

Dr. Fried, LDA

Bartonella rashes

Under the arm

Dr. Fried, LDA

Bartonella rashes

Lower back

Dr. Fried, LDA

Bartonella rashes

Mixed linear and papular - thigh Dr Fried, LDA

Bartonella rashes

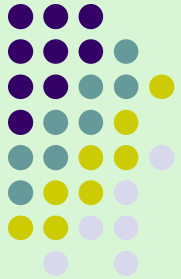
Mixed linear and papular - back

Dr. Fried, LDA

Bartonella rashes

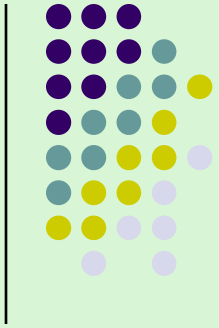
Bartonella rashes

Evaluation



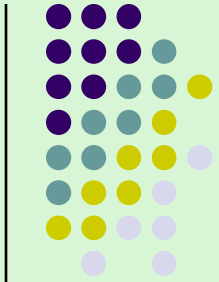
- Physical examination, continued
  - Neurological
    - Cranial nerves, EOMs: saccadic movements, tracking abnormalities, convergence insufficiency (JAG, Dr. Jones)
    - Motor strength and tone (floppy), sensory
    - Cerebellar, balance, gait
    - Reflexes
    - Speech, language
  - Psychological
    - Affect, behavior, appropriateness, attentiveness
    - Interactions with parents, siblings

Evaluation



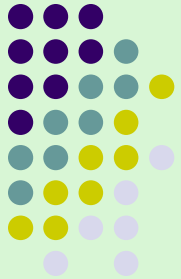
- Laboratory testing
  - CD57 at LabCorp
  - Igenex: full panel of tick borne disease testing (Lyme Western blot, full panel of titers (Babesia FISH RNA, Erlichia (HGE and HME) and Bartonella titers (usually negative, if suspect go on to do Fry test) (JAG)
  - Fry test (stained blood film smear with photo and Giemsa) 87207, 87205), get photo of Hemobartonella vs Mycoplasma, central clearing may be Babesia ingesting the nuclear DNA), parasites intraRBC suspected to be Babesia, doing genetic testing. Coming out next wk with biofilm photos. (JAG)

Lab testing continued



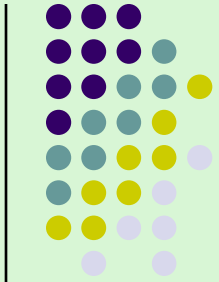
- EBV, CMV, HHV-6, HSV1 and 2, *Chlamydia pneumonia, Mycoplasma* pneumonia titers and Mycoplasma fermentens titers (JAG)
- Urinary dipstick in office for sulfates
- Medical work up: CBC diff, CMP, HLA biotoxin illness, autoimmunity, hypercoagulability, heavy metals, hormones, stool analysis, food allergy panels

Evaluation



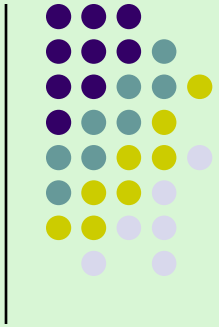
- Laboratory testing, continued
  - At birth test using PCRs
    - First baby urine
    - Cord blood
    - Placenta, foreskin
    - Follow monthly urine PCR for Bb
- Imaging
  - Brain SPECT scanning
    - Can be normal even in significantly compromised children. If abnormal, it is VERY significant.
    - Amen Clinic, Reston, VA scans show perfusion and metabolism at rest and with concentration

Evaluation



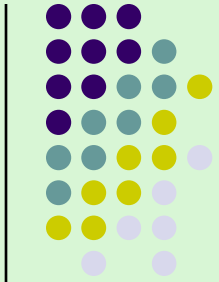
- Mold testing/evaluation of home, school, car
- Ask about exposure to biologically incompatible frequencies, EMFs
  - Get TVs and computers out of bedroom
  - Limit or eliminate computer/video game use

Pathophysiology



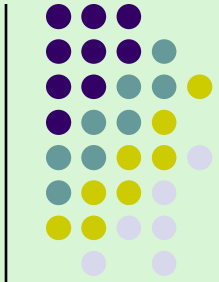
- Multiple infections
  - Multisystem organ damage, **especially of the nervous system, from** tick borne infections as well and others: e.g. the herpetic family of viruses, Chlamydias, Mycoplasmas
- Gut dysbiosis
  - Mucosal infection, biofilm formation, redox changes
  - Leaky gut with food allergies and gluten intolerance
  - Up regulated TH-2 +/- TH-1
- Liver detoxification abnormalities
  - Sulfation, methylation, homocysteine/methionine, MTHFR (methylenetetrahydrofolate reductase) deficiency, folate/BH4 pathway

Pathophysiology



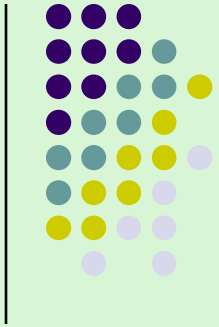
- Up regulated systemic inflammation
  - Lipid abnormalities
  - cytokine imbalance
- Immune system anergy
  - Need to correct cytokine imbalances and down regulate inflammation while up regulating activity against specific targeted pathogens
- Vasculitis
- Hypercoagulability
- Bone marrow metabolic dysfunction
  - persistent thrombocytopenia, general neutropenia or specifically lymphopenia, anemia

Pathophysiology



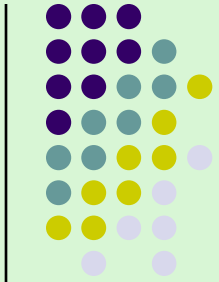
- Autoimmunity
  - Thyroid - TPO, thyroglobulin antibodies
  - Endothelium - anticardiolipin antibodies
  - Nerve tissue - myelin basic protein antibodies
  - Gut - antigliadin antibodies
  - Positive ANA or RF
- Central nervous system
  - Oxidative stress
  - Decreased glutathione levels
  - Altered homocysteine/methionine metabolism
  - Impaired methylation and sulfation with elevated sulfate and ammonia levels

Pathophysiology



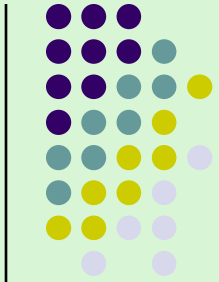
- Biotoxin illness in susceptible HLA types (about 25% of the population).
  - Biotoxins are water and lipid-soluble inonophores from indoor toxic mold, Bb, Bm and *Pfiesteria sp.*
    - Alter DNA expression of fat cells turning on production of inflammatory cytokines that up regulate systemic inflammation, increase insulin resistance, increase bad lipid levels, alter levels of VEGF and PAI-1.
    - Bind to and damage leptin receptors in the hippocampus and hypothalamus leading to breakdown of the proopiomelanocortin system with resultant deficiencies in two very important master regulating hormones: MSH (melanocyte stimulating hormone) and VIP (vasoactive intestinal peptide). Ongoing damage of hippocampus, hypothalamus and both anterior and posterior pituitary affect all hormonal systems.

Pathophysiology



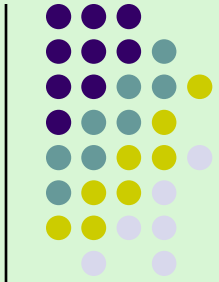
- Hormonal dysfunction
  - Insulin and leptin resistance
  - Thyroid insufficiency or autoimmunity
  - Sex hormone deficiencies
  - Renin-angiotensin system and antidiuretic hormone abnormalities
  - Adrenal gland stress, resistance or exhaustion
- Heavy metal toxicity (mercury, aluminum, arsenic)
- Patients often have a history of prior physical, emotional, or psychic trauma

Management



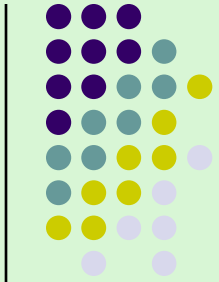
- Diet
  - Paleolithic principles
  - Gluten, sugar, yeast free (oligoantigenic)
  - Individualized dietary restrictions
    - Food allergy panels, AK testing
- Environment
  - Mold - home, school/day care must be cleared
    - Cholestyramine resin
    - Algae products
    - Homepathics
  - EMFs or biologically incompatible frequencies

Management



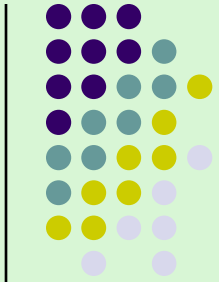
- German Biological Medicine/Homotoxicology
  - Assess where patient is within the six phases:
    - Excretion
    - Inflammation
    - Deposition
    - Impregnation
    - Degeneration
    - Neoplasm

Management



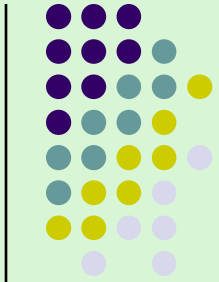
- Restore vitality
  - Rebuild vital heat and energy
- Restore health and function of matrix
  - Clear biofilms, toxicity, infection and tissue injury
  - Restore communication throughout matrix
- Restore metabolic function of
  - GALT
    - Heal leaky gut
    - Break up pathogenic biofilms and remove infectious and dysbiotic organisms
    - Restore healthy mucosal redox potential

Management



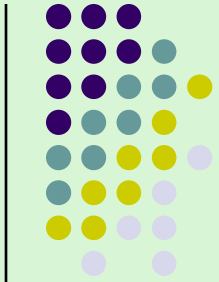
- Restore metabolic function of, continued
  - Repopulate with healthy pre- and probiotics
  - Restore digestive vitality, normal fluid flows and mechanical activity
  - Liver
    - Clear methylation, sulfation detoxification blockades (MTHFR gene?)
    - Clear toxins and infections
    - Improve bile flow and gallbladder function
  - MALT
    - Sinus biofilms, allergic up-regulation
    - Oro-pharyngeal and cervical lymphatics
    - Respiratory airway reactivity

Management



- Restore metabolic function of, continued
  - Bone marrow
    - Restore normal immune cell line production
  - CNS
    - Lower oxidative stress
    - Lower ammonia and sulfate levels
    - Repair myelin sheaths and cell membranes
- Restore regulatory function to
  - Neuro-immune and neuroendocrine systems
  - Neuro-vascular and vascular endothelial system
    - Hypercoagulability
- Cycle: release/provoke/release/provoke/release

Management



- Therapeutic tools and medicines
  - Spagyric homeopathic/herbal medicines
    - Pekana - incredibly magical medicines
    - Energetix spagyrics, Nestmann (not spagyric)
  - Immune-modulating/immunobiologic medicines
    - Syntrion and San Pharma - homeopathics preparations of metabolic products from common fungi and bacteria that have immune regulating and immune modulating effects
      - Syntrion cellular reprogramming medicines are elegantly effective and a delight to use
    - Transfer factors
      - Researched Nutritionals - wonderful range of TFs

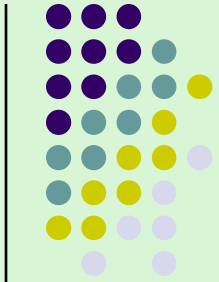
Management

- Therapeutic tools and medicines, cont.
  - Nutrition repletion/supplementation
    - Fresh organic diet, grass-fed meats, sprouted grains
    - MVI with trace minerals, magnesium
    - Essential fatty acids
      - DHA in children, Phos. serine, GPC, Phos. choline
      - EPA and DHA for adolescents and adults
    - Activated co-enzyme forms of B vitamins (folinic acid, BH4, methyl B12)
    - Antioxidants of all kinds
      - Vit C, Vit D, Vit E (gamma), R-lipoic acid and other cerebral antioxidants (Cerebro PTC, Fibroboost)

Management

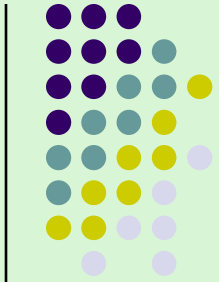
- Therapeutic tools and medicines, cont.
  - Mitochondrial energy resuscitation nutrients
    - CoQ10, NAC, acetyl L carnitine, D-ribose, R-lipoic acid, organic acid homochords (Lactiplus, Citiplus, Formiplus from Pekana), NT Factor Energy (Researched Nutritionals)
  - Multitude of nutritional creams from Health Pro Labs
    - Molybdenum, ornithine
    - Folinic acid/TMG or folinic acid/TMG/B12
    - B12, CoQ10, Vit D3, Vit C, taurine, melatonin, GABA, GABA/theonine, R lipoic acid
    - Glutathione with/without R lipoic acid, niacin
    - “Autistique”, MS, Cognitive therapy
    - Magnesium citrate, magnesium sulfate

Management



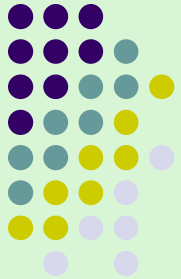
- Therapeutic tools and medicines, cont.
  - Probiotics
    - Bacterial and yeast
      - Klaire labs, Prescript Assist (RN), BaCloFlor (MF), Theralac
  - Gastointestinal repair nutrients
    - Glutamine, SyCol (Syntrion), Permeability Factors, deglycerated licorice, aloe
  - Heavy metal binders
    - Pectasol, chlorella, Artic Alginate (Energetix), Modifilan, Body Guard, Interfase Plus (Klaire Labs)
  - Vaccination stress removal
    - Homeopathics (Pekana, Energetix)

Management



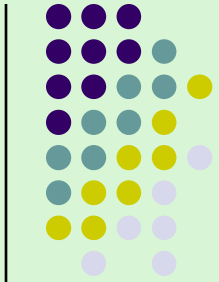
- Antimicrobial treatment of infections
  - Allopathic antibiotics
    - *Borrelia*: CW (PCN or cephalosporin) and intracellular (macrolide, TCN), hydroxychloroquine, Flagyl, Tindamax
    - *Bartonella*: doxy and macrolide, doxy and rifampin, Bactrim and rifampin, quinolone
    - *Babesia*: Mepron, macrolide, hydroxychloroquine, artemisinin, Bactrim
    - Mycoplasmas: macrolide, ?quinolone
    - Chlamydias: macrolide, rifampin

Management



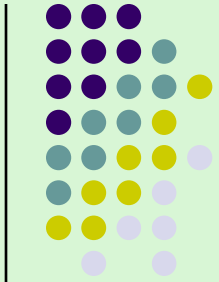
- Antimicrobial treatment of infections, cont.
  - Non allopathic antimicrobials
    - Cowden Protocol “killers”
      - Cumanda, Samento, Quina
      - Banderal, Mora, Enula
    - Homeopathics/herbal antibiotics and antivirals from diverse companies that utilize traditional Native American, South American, European and Asian traditions to target
      - CMV, EBV, HHV-6, HSV1+2
      - *Mycoplasma, Babesia, Chlamydia*

Management



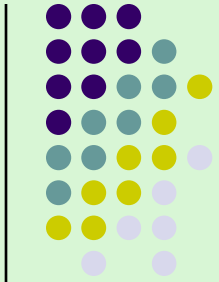
- Referrals, as needed
  - Cranial osteopathy
    - Any history of trauma
  - Chiropractic neurology
    - Rehabilitation for the brain, rewiring neural circuits
  - Chiropractic
  - Acupuncture
  - Lymphatic drainage
    - Lymph Star Pro machine
    - Massage
- Physical exercise/rehabilitation when able

Case presentation of mother



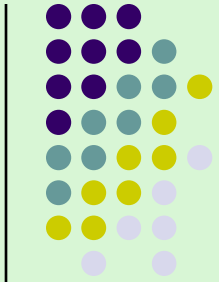
- 24 y/o woman ill for several years
  - Risk factors: other family members with TBD and a life time of outdoor activities, but no tick bite history
  - ROS: chronic fatigue, dysesthesias, stiff and sore neck, joint pains, LBP, SOB, depression, insomnia, rage attacks
  - Incomplete testing: 5 species specific bands *Bb* on WB at Igenex and low CD 57 of 22
  - Patient was noncompliant after three months of treatment
  - Returned 8 months later 12 weeks pregnant. Many symptoms much worse: especially uncontrollable rage attacks, intense HA, debilitating fatigue, horrible brain fog, recurrent sacral shingles and ”sciatica”.

Case presentation of mother



- Treatment prescribed: Amoxicillin 1 gm TID, Zithromax 600 mg QD, prenatal vitamins and no fish! She took only a few weeks of Amoxicillin before 26 weeks gestation due to hyperemesis gravidarium, but was consistent with both antibiotics from about 26 weeks until delivery at term by SVD, baby with Apgars 9, 9. She stopped treatment at child's birth and breast fed for 5 months off antibiotics. Baby boy's chord blood, placenta, foreskin negative for *Bb* PCR. Baby's physical exam at 3 weeks of age normal except for suboccipital, chest and lateral calf hemangiomas and oral thrush.
- Lost to follow up until grandmother called one year later to say mother was hospitalized for depression and uncontrollable rage and was having trouble caring for baby.

Case presentation of child



- 22 m/o boy recently diagnosed with autism
  - History since negative testing at birth

4 months age: severe reaction to first round of vaccines with fever 103 -104, projectile vomiting, and dehydration (DTaP, HepB, IPV, Hib, Pneumo conj)

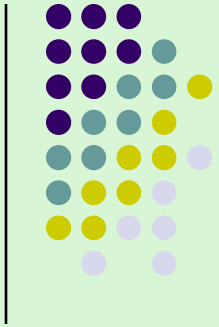
8 months age: again, fever and projectile vomiting at second round of vaccines (same)

91/2 months age: again sick with third round of vaccines (same as above plus influenza)

11 months age: second influenza vaccine made him so sick he needed ER care

Chronic URIs with deep cough. One OM with fever 104

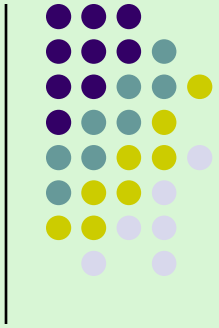
Case presentation of child



- Review of systems

  Chronic dark circles under eyes; night sweats; walking stairs one foot at a time for last 4 months; good gross and fine motor control but doesn't use index finger at all; purposeless repetitive hand movements; just starting with vocalization of any kind; doesn't follow any directions; doesn't respond to name; doesn't interact with other kids (kicked out of day care); doesn't handle transitions well; gets very obsessed with activity and gets very upset if interrupted; must step on all the cracks in sidewalk; doesn't like to be

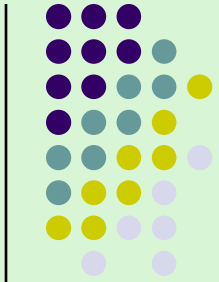
Case presentation of child



- Review of systems, cont.

  touched; won't kiss or hug; hates having hair brushed; likes deep rough massage; has trouble swallowing even soft foods; often shudders at sight of food; halitosis; yellowish diarrhea about one week a month; severe diaper rash (bleeds); yeast rash on penis; fights every diaper change; seems sensitive to clothing touching skin; sleeps very well, 12-13 hr at night, 2-4 hr nap; horrible to wake up but OK if he wakes spontaneously; very irritable; upset; screams if interrupted in play; circles around things when agitated; becomes aggressive physically when excited or frustrated; poor spatial awareness.

Case presentation of child



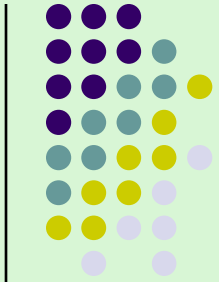
- Physical exam

  Uncooperative; normal height/weight(27 lbs) /HC for age; afebrile; HEENT unremarkable; yellow diarrhea stool in diaper; normal genitalia; no rash except for diffuse mottling of skin and three persistent hemangiomas; palpable synovitis of wrists, knees, ankles bilaterally; not responsive to name; babbling speech; repetitive hyperactive behaviors; not using index finger.

- Laboratory evaluation

  Igenex WB: IgM IND 23-25, IgG IND 39, ++ 41

Case presentation of child



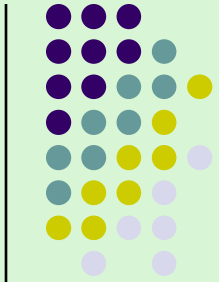
- Initial treatment

  Amoxicillin 400 mg TID and Zithromax 100 mg BID, Syntrion immune modulating tablets (SyCircue, SyInfect) and lotions (SyCircue, SyImmune),

  HPL Autistique and B12 creams and Energetix☐Drainage Tone, MVI, antioxidants, DHA.

  Patient also enrolled in early intervention therapies (speech, OT, home teacher until age 3) from local county as result of autism/pervasive developmental disorder diagnosis.

Case presentation of child



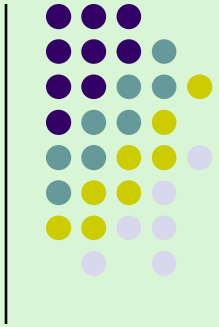
- Course

  Within one month: was following some directions; showed affection by kissing grandmother twice; started with pretend play; becoming interactive with adults and children; can pull a toy along the ground; repeating words; identifying pictures correctly; stopped taking clothes off as if bothered by them; laying quietly for diaper changes; less temper tantrums

- Treatment

  Continued same, adding homeopathic treatment for vaccines, add whey protein, better probiotics

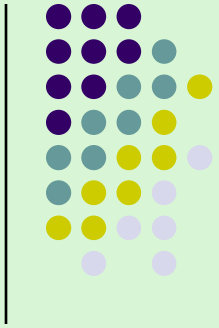
Case presentation of child



- Course

  3 months into treatment child still improving: had eye blinking for 2 weeks; “his mind is really catching up”; repeating lots of words; just starting to communicate his needs; eating more kinds of foods; gaining weight; holding pen/pencil; giving kisses spontaneously; acting out more when angry; still gets frustrated easily; on examination: more responsive, still screaming spontaneously intermittently, no more synovitis on exam.

Case presentation of child



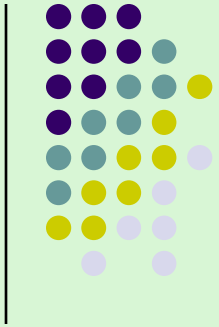
- Treatment

  Increased Zithromax to 200 mg BID and changed Amoxicillin to 800 mg BID, all rest same except add extra phosphatidyl serine and homeopathics to help remove metals

- Course

  5 months into treatment (26 1/2 months old) child is still improving: county psychologist saw “tremendous improvement”; grandmother reports he is acting like a normal 2 y/o dressing himself, wanting to feed himself; he is understanding concepts faster; better pretend play; sits to look at book on her lap; exploding in verbal skills although still very visual; understands

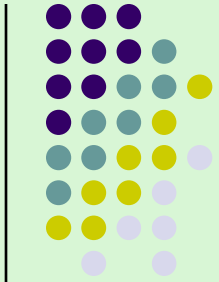
Case presentation of child



- Course, continued

  “first, then” sequence commands; repeating words and phrases up to three words; likes physical hugs and kisses; swinging on swing hard for 15 minutes or bouncing on trampoline dramatically reduces tantrums, frustration level and hyperactivity; overall handling frustration better; tantrums are less prolonged; loves to spin without getting dizzy; grandmother reports for first time to me about what she felt was a previously lazy or wandering eye that has since disappeared; he has better eye contact; actually “felt” his grandmother staring at him, looked

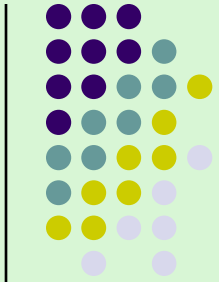
Case presentation of child



- Course, continued

  up and spontaneously smiled at her; doesn't seem to get hungry; eats a limited variety of foods; is physically repulsed by meat of any kind; skin gets dermagraphia reaction when stroked; sometimes wakes crying at night; on examination: was up 2 more pounds; had red crescents in pharynx; better eye contact; followed one direction consistently, but not sequence of two at a time; more interactive and more easily consolable despite it being nap time.

Case presentation of child



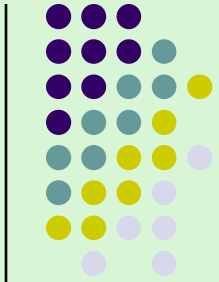
- Treatment

  Continue everything the same except add Modifilan 1/2 capsule every other day in yogurt to bind toxins and metals.

- Course

  Grandmother called two weeks later to say that the evaluating psychologist at the county early intervention program was considering removing the diagnosis of autism from the child's chart. A decision would be made at the fall evaluation.

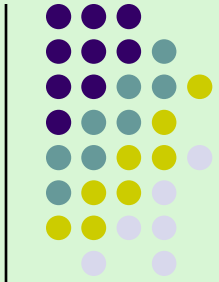
Case presentation of child



- Course

  7 months into treatment (28 1/2 months old) child continues to improve with normal social interaction with other children the same age, handling transitions better, using two word sentences, and entertaining himself with a pull toy in the office. He still gets car sick, gets red pinnae often in the afternoons and has still has limited food choices (eggs, macaroni and cheese, yogurt, cheese).

Case presentation of child



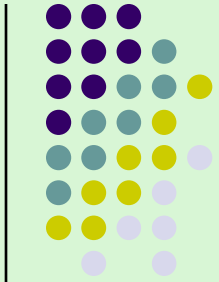
- Course, continued

  On exam, red pharyngeal crescents persist. The child was more verbal, more responsive, following directions appropriately and singing his ABCs.

- Treatment

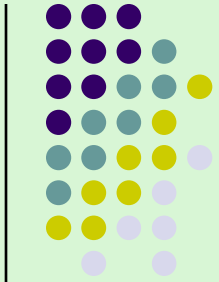
  All supplements continued as before. Amoxicillin was discontinued, Zithromax continued and metronidazole started at 125 mg po BID.

Caveats



- Any child who becomes ill after a tick bite needs a full evaluation for the presence of co-infections
- Any child who becomes ill after a tick bite who was treated with 3 to 4 weeks of oral antibiotics has most likely been inadequately treated
- Initial inadequate treatment makes future treatment more difficult

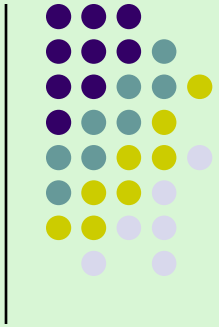
Caveats



- Neurological and/or neuropsychiatric signs and symptoms are often the first and only presenting sign of infection

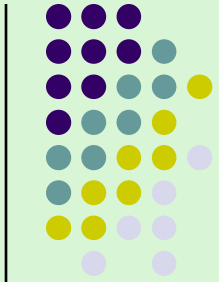
- Neurological and/or neuropsychiatric signs and symptoms are often the most common indication of persistent infection after inadequate treatment

Pediatric antibiotic dosing



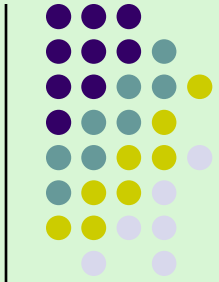
- Amoxicillin 50-100 mg/kg BID e.g. 400 BID for 2-3 y/o
- Bicillin 1.2 million units IM weekly in over 7-8 y/o, up to twice weekly, depending on size of buttocks (limiting factor in using Bicillin is size of buttocks muscles)
- Omnicef 125-250 mg BID up to 100 lbs
- Cedax under 8 y/o 90 mg BID, over 8 y/o up to 180 mg BID
- Ceftin 125-250 mg BID up to 100 lbs

Pediatric antibiotic dosing



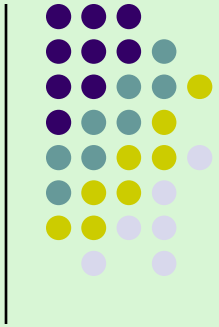
- Ketek 400 mg 6 y/o and up (I’ve given it as young as 4y/o with excellent results)
- Zithromax 100 mg to 250 mg BID
- Biaxin 125-250 mg BID Careful: Biaxin can cause psychosis
- tinidazole can be given as young as 1-2 y/o at 125 mg BID, older 250 mg BID
- Flagyl 125 mg BID 1-3 y/o, older 250 mg BID
- Rifampin, ask pharmacist to make suspension 30 mg/ml. Dose at 10-20 mg/kg up to 600 mg daily

Pediatric antibiotic dosing



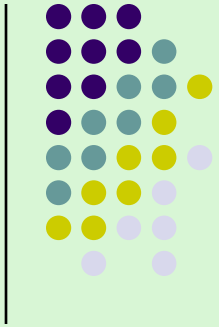
- Plaquenil 100-200 mg BID, especially if 31 or 39 kDa bands present as these often associated with high degree of autoimmunity. (I also use Plaquenil if a lot of joint pain is present due to its anti-inflammatory as well as anti-Borrelia effects)
- Mepron, use highest dose tolerated 1/2 to 1 tsp BID
- Minocin or doxycycline over 8y/o use 50-100 BID (I have pushed Minocin to 300 mg/day in 9-12y/o) Minocin can cause increased ICP with papilledema (PTC), especially in peri-pubescent girls)

Pediatric antibiotic dosing



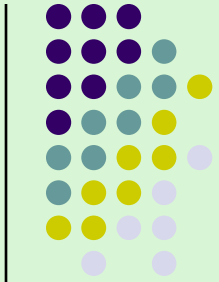
- Ciprofloxacin 250 - 500 mg BID. Ciprofloxacin often tolerated as young as 12 y/o. (I have used it as young as 8 y/o successfully)
- Cannot use Levaquin in children as they have more tendon/muscle problems than adults
- Cholestyramine resin dosing in under 100 lbs or under 12 y/o give 60 mg/kg per dose
- “Sleepers” to use in kids: Benadryl, chloral hydrate, Sonata (over 6 y/o), benzodiazepines, melatonin cream or spray

Pediatric antibiotic dosing



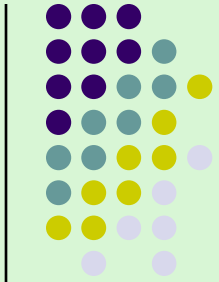
- IV Rocephin 75 mg/kg up to 2 gm QD
- IV Zithromax 200-400 mg QD in over 12 y/o
- IV doxycycline rarely used by Dr. Jones in kids
- IV Claforan 100 m/kg up to 2 gm/dose BID (can suppress bone marrow causing decrease in WBC and RBC)
- IV Primaxin OK in kids, crosses BBB better than PCN

Pediatric dosing caveats



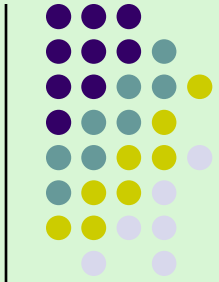
- For Ehrlichia: in kids under 8 y/o use 1-4 wks of doxycycline 1/2 tsp BID
- For Bartonella: in children under 8 y/o use rifampin and Bactrim together for 1 wk to 3 months
- For Borrelia: Zithromax and rifampin often good in combination, e.g. for 85 lb 10 y/o dose would be rifampin 150 mg BID and Zithromax 250 mg BID
- For Borrelia: Zithromax (intracellular) and cephalosporin or PCN (CWAbx) in combination

Pediatric dosing caveats



- For autism symptoms: Flagyl and Zithromax often good in combination
- For neurological tics: clonidine 0.1 mg QD
- With unrelenting HA and paresthesias think Babesia co-infection
- Safe in pregnancy: PCN, cephalosporins, macrolides
- Not safe in pregnancy: quinolones, tetracyclyines, Flagyl, Bactrim

Pediatric dosing caveats



- Dr. Jones has treated children with anywhere from 3 months to 7 years of continuous antibiotics. He does not pulse treatment, but always uses continuous antibiotic therapy. Duration of treatment is based on the child's symptoms. Continue antibiotics for a full 2 months after all symptoms have resolved, and until there is no recurrence of Lyme symptoms with concurrent infections, injury/trauma, surgery, emotional trauma or menses. Also treat until the child him/herself feels that the "Lyme bugs" are gone. Always ask the child what he/she thinks!

Dr Jones' WB interpretation

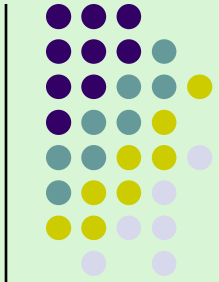
Charles Ray Jones, M.D.

Addendum Regarding Lyme Serology

There are nine known (Lyme) *Borrelia burgdorferi* genus species specific kDa Western blot antibodies (bands): 18, 23-25, 31, 34, 37, 39, 83-93.

Only one of these *Borrelia burgdorferi* genus specific bands in needed to confirm that there is serological evidence of exposure to the *Borrelia burgdorferi* spirochete and can confirm a clinical diagnosis of Lyme disease.

Dr Jones' WB interpretation

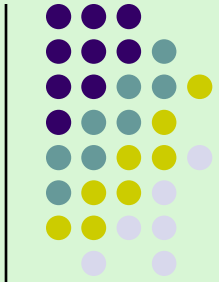


CDC Western Blot IgM surveillance criteria includes only two *B burgdorferi* genus species specific antibodies for IgM 23 and 39 and excludes the other seven *B burgdorferi* antibodies.

CDC Western Blot IgG surveillance criteria includes 18, 23, 30, 37, 39 and 93 and excludes bands 31,34 and 83.

It does not make sense to exclude any *B burgdorferi* genus species specific antibodies in a Lyme…

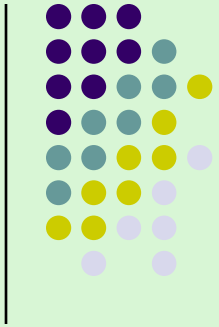
Dr Jones' WB interpretation



….Western Blot, and to include only two of these antibodies in IgM because all the antibodies in IgG were once IgM.

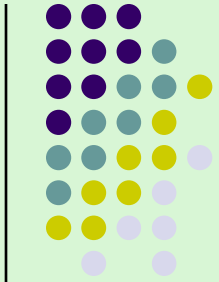
IgM converts to IgG in about two months unless there is a persisting infection driving a persisting IgM reaction. This is the case with any infection, including a B burgdorferi induced Lyme disease.

Dr Jones' WB interpretation



The CDC wrongfully included five non-specific cross reacting antibodies in its Western Blot surveillance criteria: 28.41.45.58 and 66. This leads to the possibility of false positive Lyme Western Blots. There can be no false positives if only *Borrelia burgdorferi* genus species specific antibodies are considered. One can have a CDC surveillance positive IgG Lyme WB with the five non-specific antibodies without having any *Borrelia burgdorferi* genus species specific antibodies.

Dr Jones' WB interpretation



This does not make sense.

The CDC recommends that the Lyme Western Bolt be performed only if there is a positive or equivocal Lyme ELISA. In my practice of over 10,000 children with Lyme disease, 30% with a CDC positive Lyme Western Blot have negative ELISA's. The Lyme ELISA is a poor screening test. An adequate screening test should have false positives, not false negatives.

Selected references

Bransfield RC et al., The association between tic-borne infections,Lyme borreliosis and autism spectrum disorders. *Medical Hypotheses* 2008; 70(5): 967-974

Bransfield, RC. Preventable cases of autism: relationship between chronic infectious disease and neurological outcome. *Pediatric Health* 2009; 3(2) in press

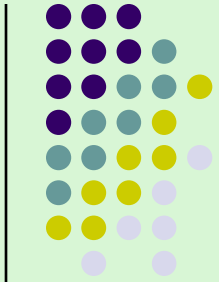
Pietrucha, MD. Neurological Manifestations of Lyme Disease in Children A review of over 300 children with LD. 1991

Bloom et al. Neurocognitive abnormalities in children after classic manifestations of Lyme disease, *Pediatric Infectious Disease Journal* 1998;17:189-96

Fallon et al. The Underdiagnosis of Neuropsychiatric Lyme Disease in Children and Adults, *The Psychiatric Clinics of North America* Sept.1998; 21(3)

Tager et al. A Controlled Study of Cognitive Deficits in Children With Chronic Lyme Disease, *The Journal of Neuropsychiatry and Clinical Neurosciences* 2001: 13:500-507

Selected references



***Borrelia burgdorferi* can be transmitted from an infected mother through the placenta to the fetus during any stage of pregnancy and can have devastating consequences**

Gardner, T., Lyme disease. In: Remington and Klein, ed. *Infectious disease of the Fetus and Newborn Infant*, Philadelphia, Saunders, 1995, p. 447-528 or 2001, p. 519-642

Jones, CR, Smith H, Gibb E, Johnson, L, Gestational Lyme disease case studies of 102 live births. *The Lyme Times* 34-36, 2005

Schlessinger, PA, Duray, PH, Steere, AC, et al., Maternal-fetal transmission of the Lyme disease spirochete. 1985 *Annals of Internal Medicine;* 103: 67-8

Markowitz, L., Steere, AC, et al., Lyme disease during pregnancy. *JAMA* 1986; 255: 3394-6

MacDonald, A. and Burgdorfer, W. 1987: Stillbirth following maternal Lyme disease. *NY State J Med*; 87(616)

Selected references

Only published autopsy series of miscarriages, stillbirths and SIDS deaths attributed to *Borrelia burgdorferi* infection of the mother

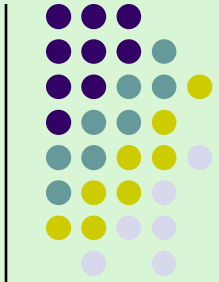
MacDonald, A. 1989: Gestational Lyme Borreliosis Implications for the Fetus. *Rheumatic Disease Clinics of North America* Nov.1989;15(4): 657-677

- Borrelia spirochetes found at autopsy in fetal brain, liver, adrenal glands, spleen, bone marrow, heart and placenta
- None of the infected tissues showed any sign of inflammation

***Borrelia burgdorferi* can infect the fetus despite antibiotic treatment of the mother during pregnancy**

Weber, K., Duray, PH., et al. 1988: Borrelia burgdorferi in a newborn despite oral penicillin for Lyme borreliosis during pregnancy. *Pediatric Infectious Disease Journal*; April; 7(4):286-289

Selected references



***Borrelia burgdorferi* found in breast milk**

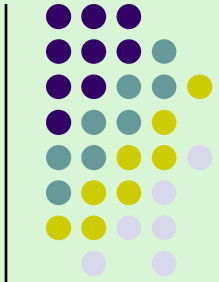
Schmidt, et al. Detection of Borrelia burgdorferi DNA by polymerase chain reaction in the urine and breast milk of patients with Lyme Borreliosis. *Diag Microbiol Infect Dis* 1995; 21(3): 121-128

Infected pregnant women need treatment

Luft, BJ, Halpern, JJ, Datwyler, RJ et al., A perspective on the Treatment of Lyme Borreliosis. *Reviews of Infectious Diseases* 1989; 2(6): S1518-S1525

"The aim of treatment of early Lyme disease during pregnancy is not only to treat the infection and prevent long-term sequelae but to eliminate the infections as quickly as possible so as to prevent congenital transmission to the fetus."

Selected references



***Babesia microti* can be transmitted to the fetus in utero**

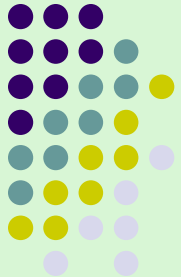
Fox, et al., Neonatal Babesiosis: Case Report and Review of the Literature. *Pediatric Infectious Disease Journal* 2006; 25(2): 169

Perinatal transmission of *Anaplasma phagocytophila* (formerly *Ehrlichia phagocytophila*)

Horowitz, HW, et al., Perinatal Transmission of the Agent of Human Granulocytic Ehrlichiosis. *New England Journal of Medicine* 1998; 339(6): 375-378.

- p. 337 “The route of infection of the infant could not be determined. The timing of the onset of illness is consistent with all three potential routes of infection (intrauterine, intrapartum, or through breast-feeding).”

Selected websites



www.ilads.org ILADS's website

www.lymedisease.org CALDA's website

The Lyme Times Children's Treatment Issue #42

The Lyme Times Children's Educational Issue #45

www.lymepa.org LDASEPA's website

www.lymediseaseassociation.org LDA's website

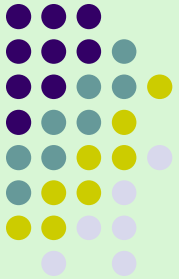
www.lymeinfo.net medical files link full of peer reviewed articles

www.lymenet.org public education source for TBD

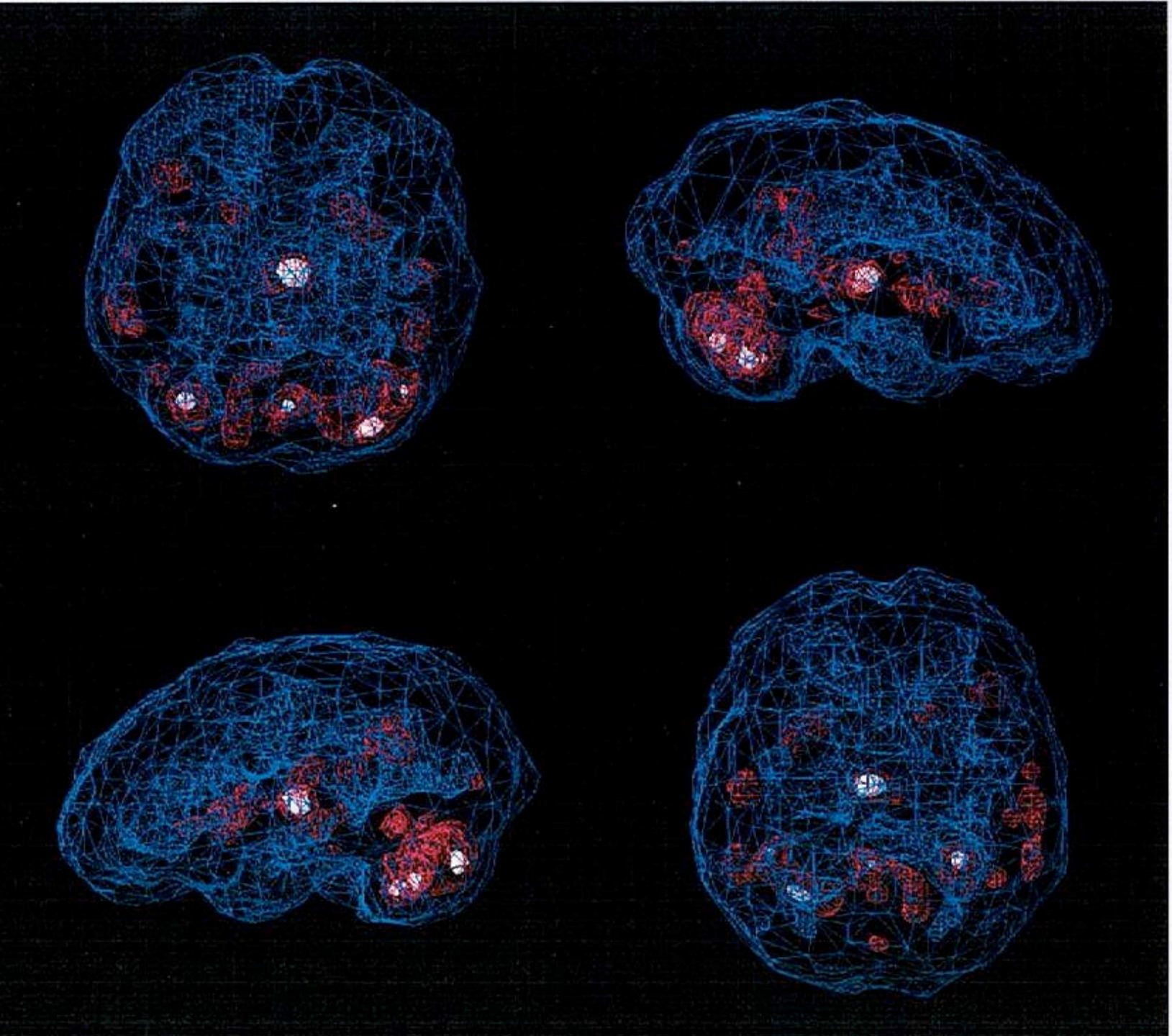
www.igenex.com Igenex Laboratories for TBD testing

www.columbia-lyme.org Lyme and Tick-Borne Disease Research Center

Resources



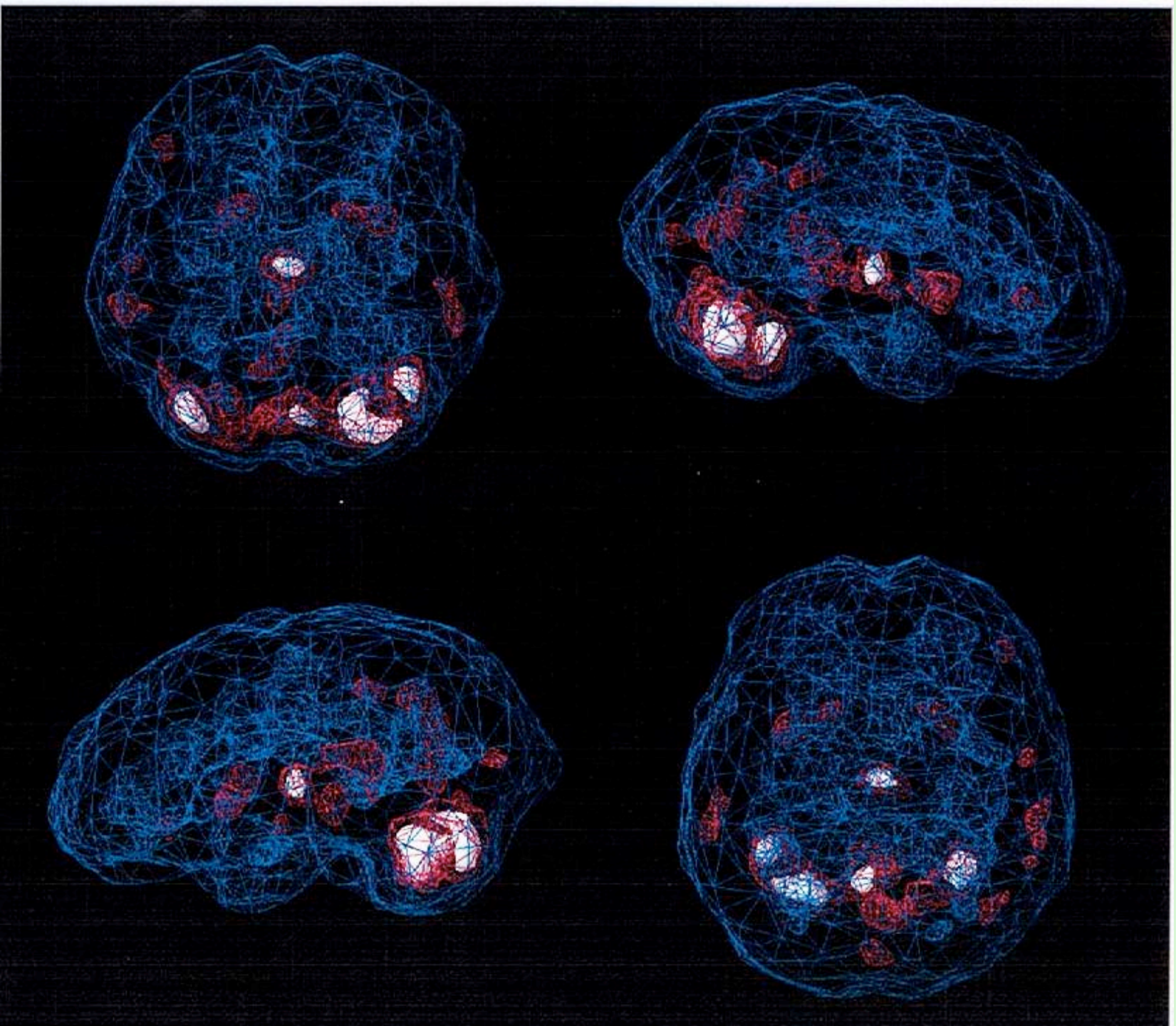
- Lyme Induced Autism Foundation National Conference, 2007, 2008, 2009



Baseline

Metabolic

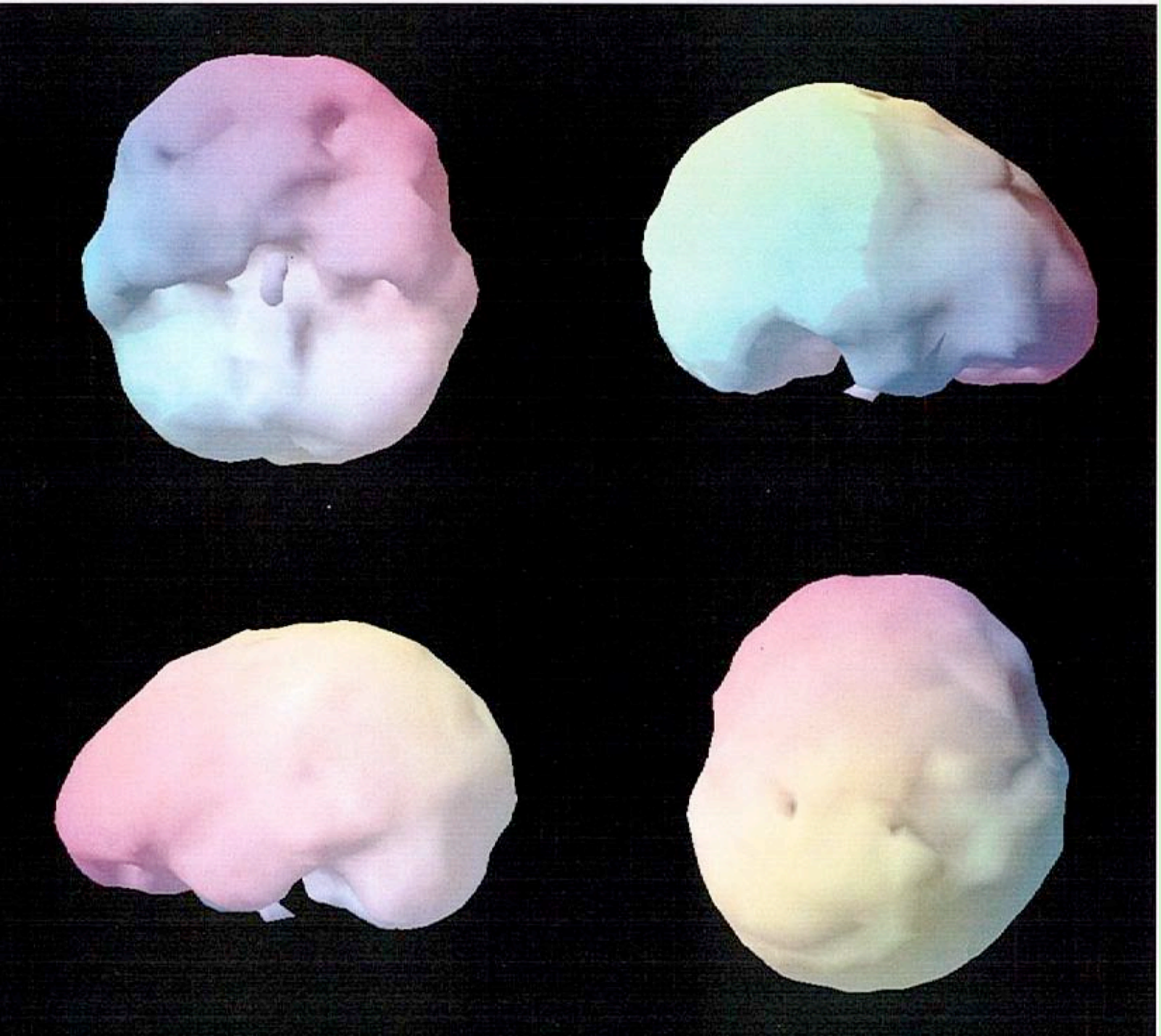
Amen Clinic



Conc.

Metabolic

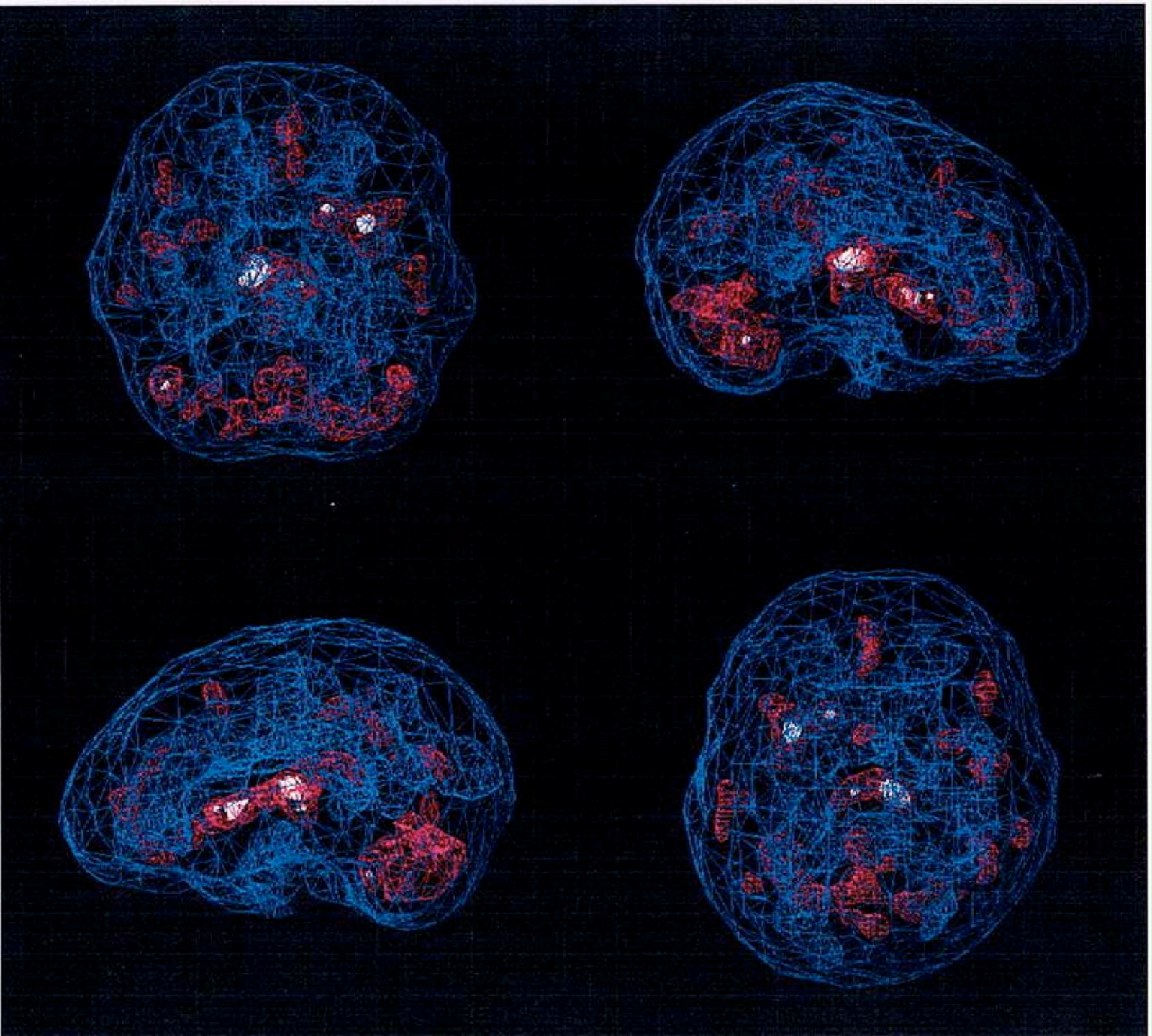
Amen Clinic



Conc.

Perfusion

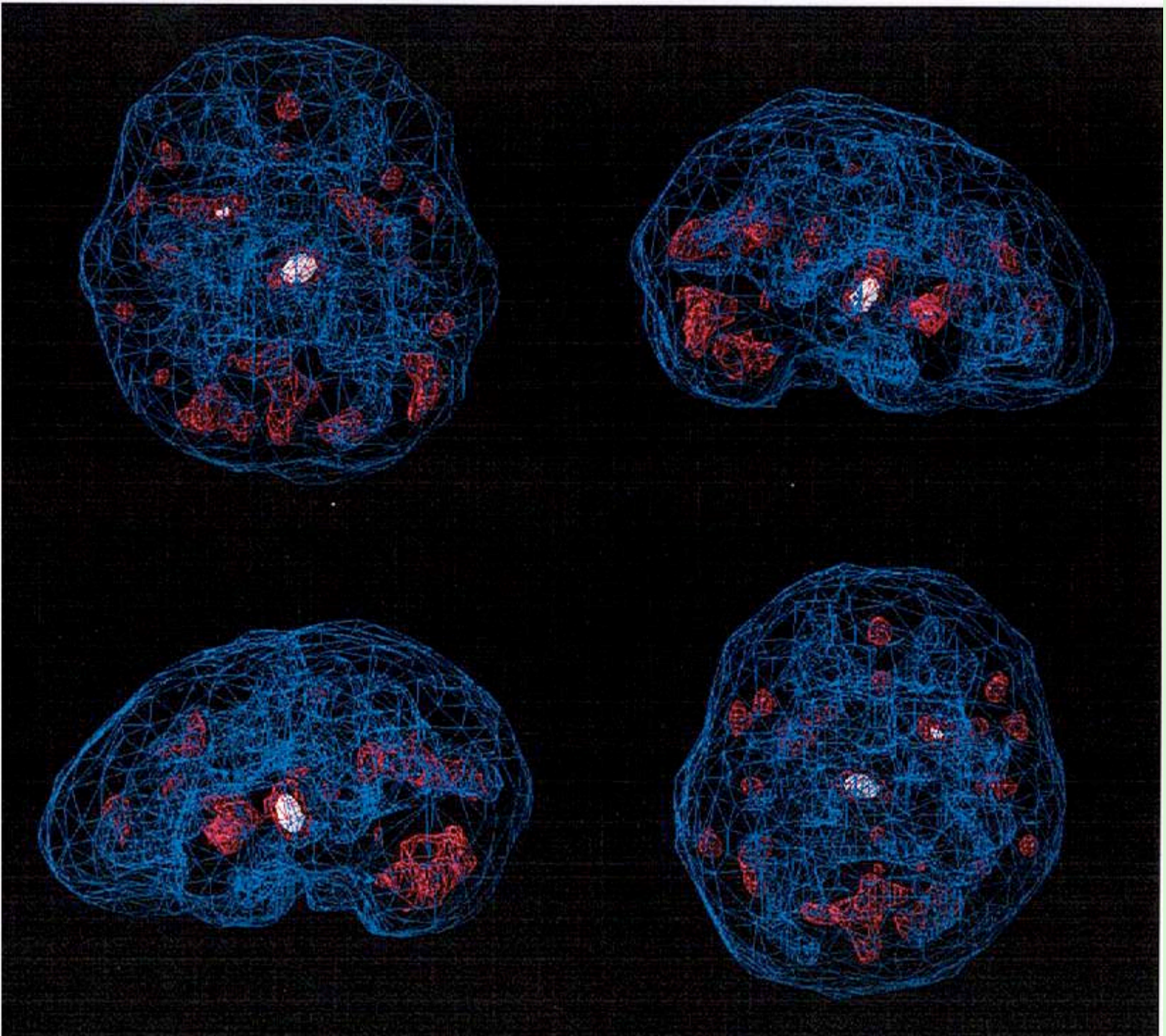
Amen Clinic



Baseline

Metabolic

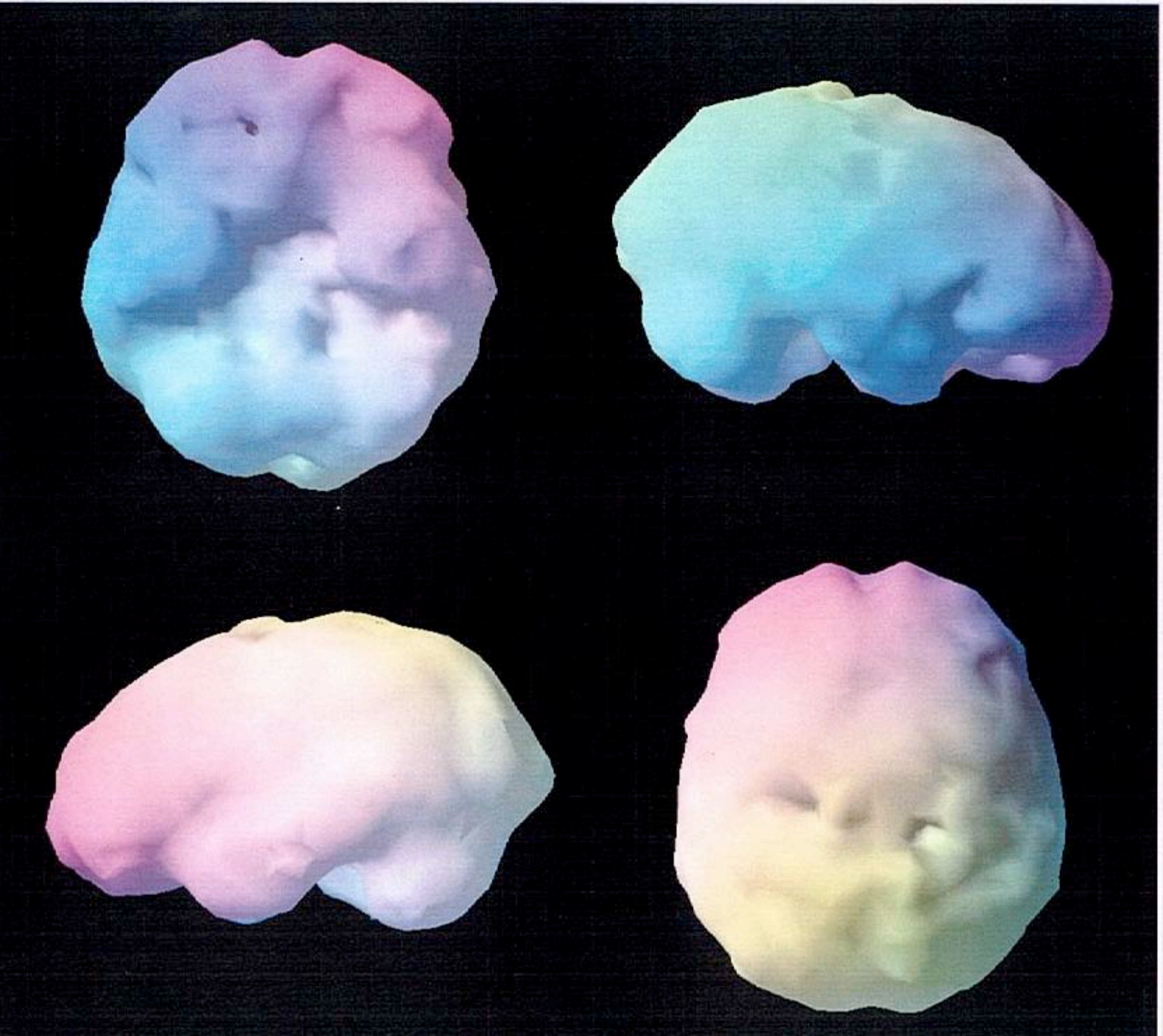
Amen Clinic



Conc.

Metabolic

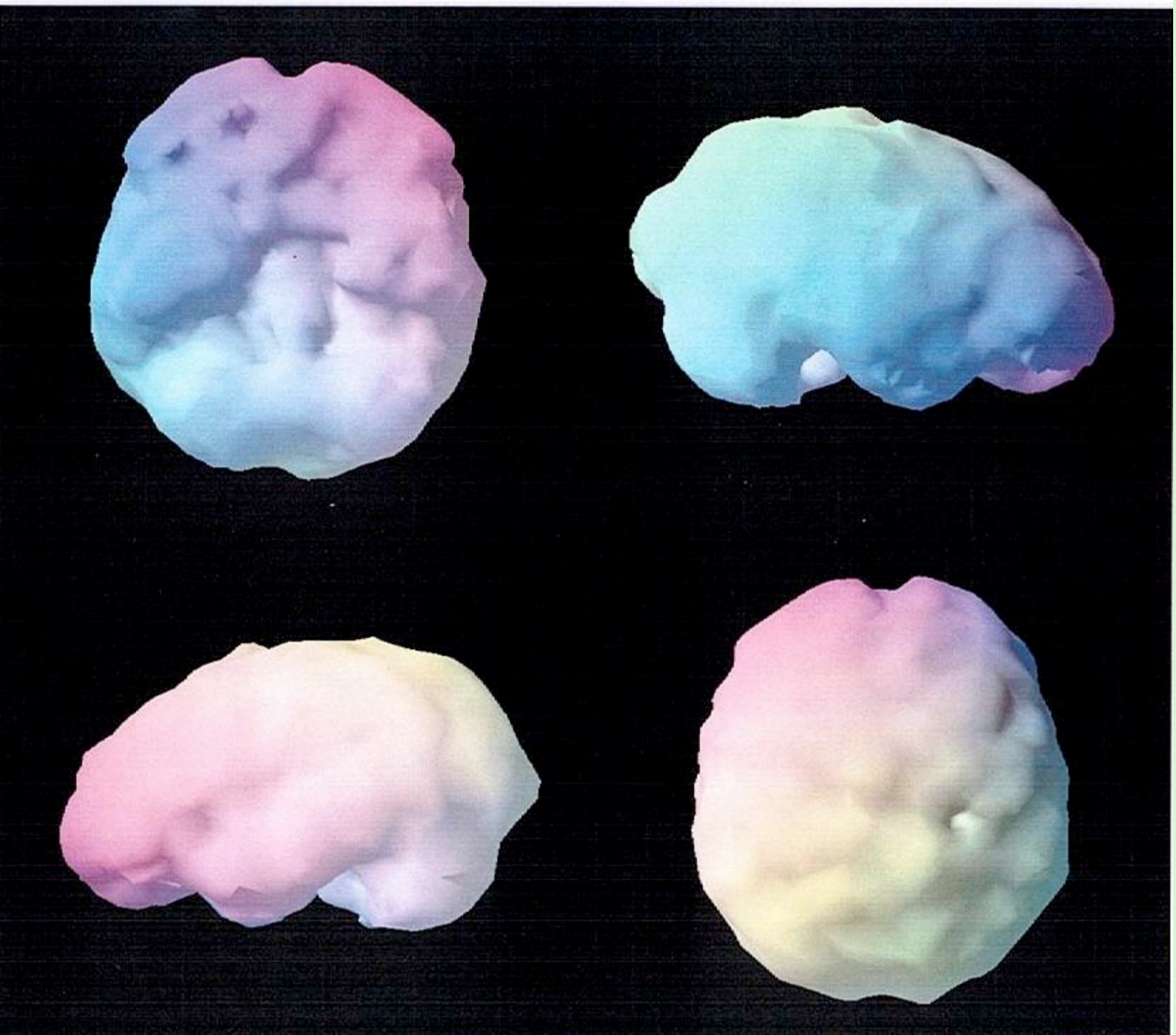
Amen Clinic



Baseline

Perfusion

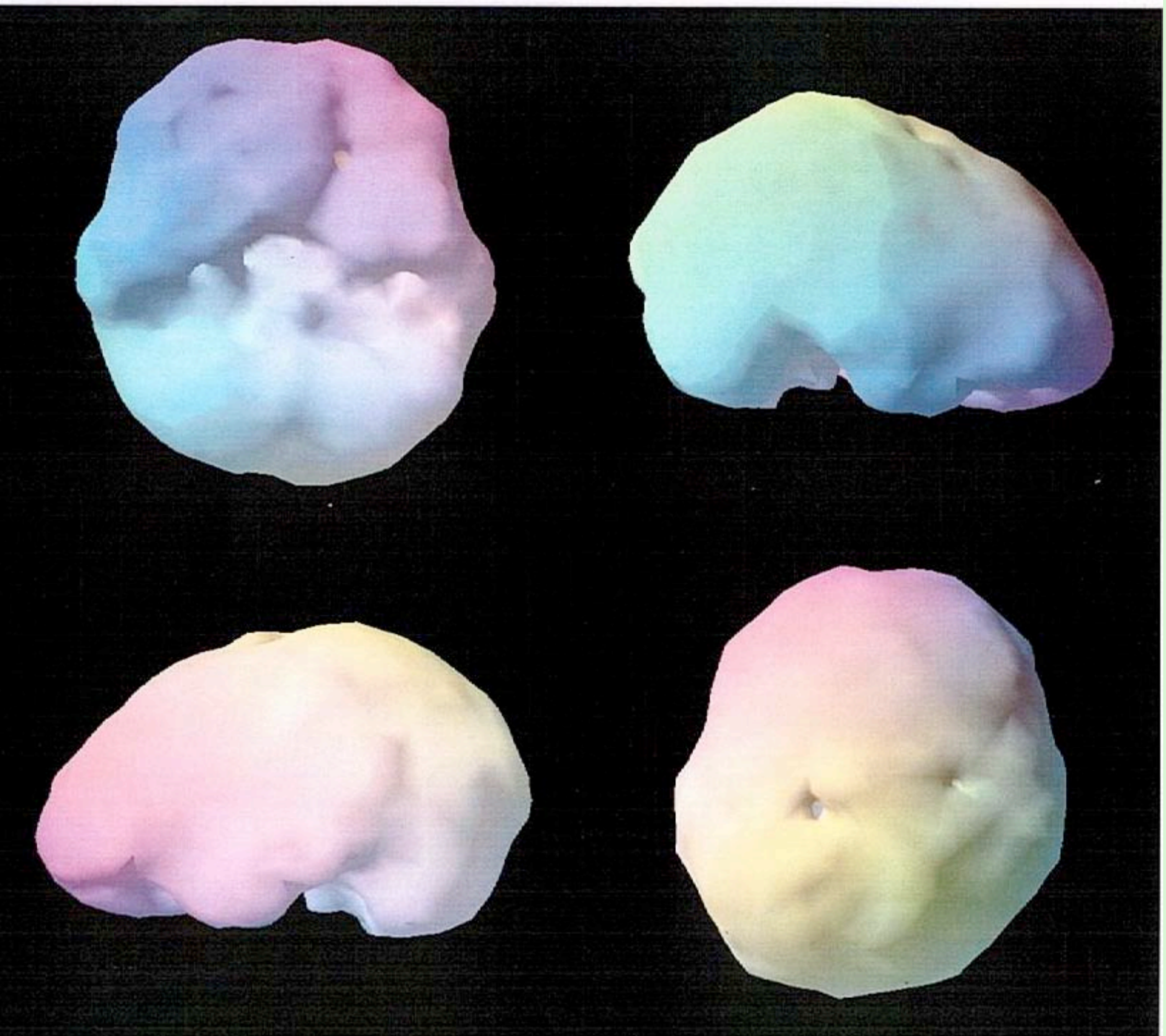
Amen Clinic



Conc.

Perfusion

Amen Clinic



Baseline

Perfusion

Amen Clinic