

PSYCHOPHARMACOLOGICAL MANAGEMENT OF ABI

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September 12th, 2013

AGENDA

- Define and discuss ABI in brief
- Enumerate Psychopathy's
- ... and then discuss Management with medications

As otherwise, there is no context within which psychopharmacology makes sense!

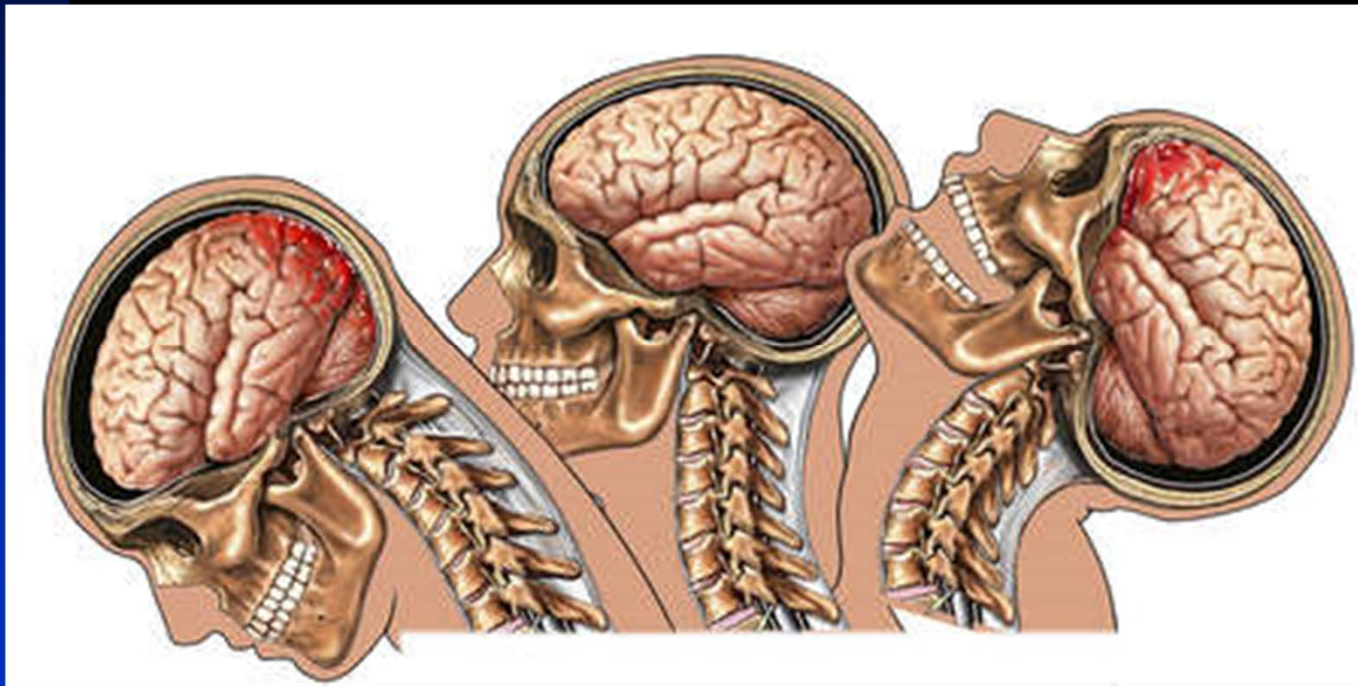


ABI IS ...

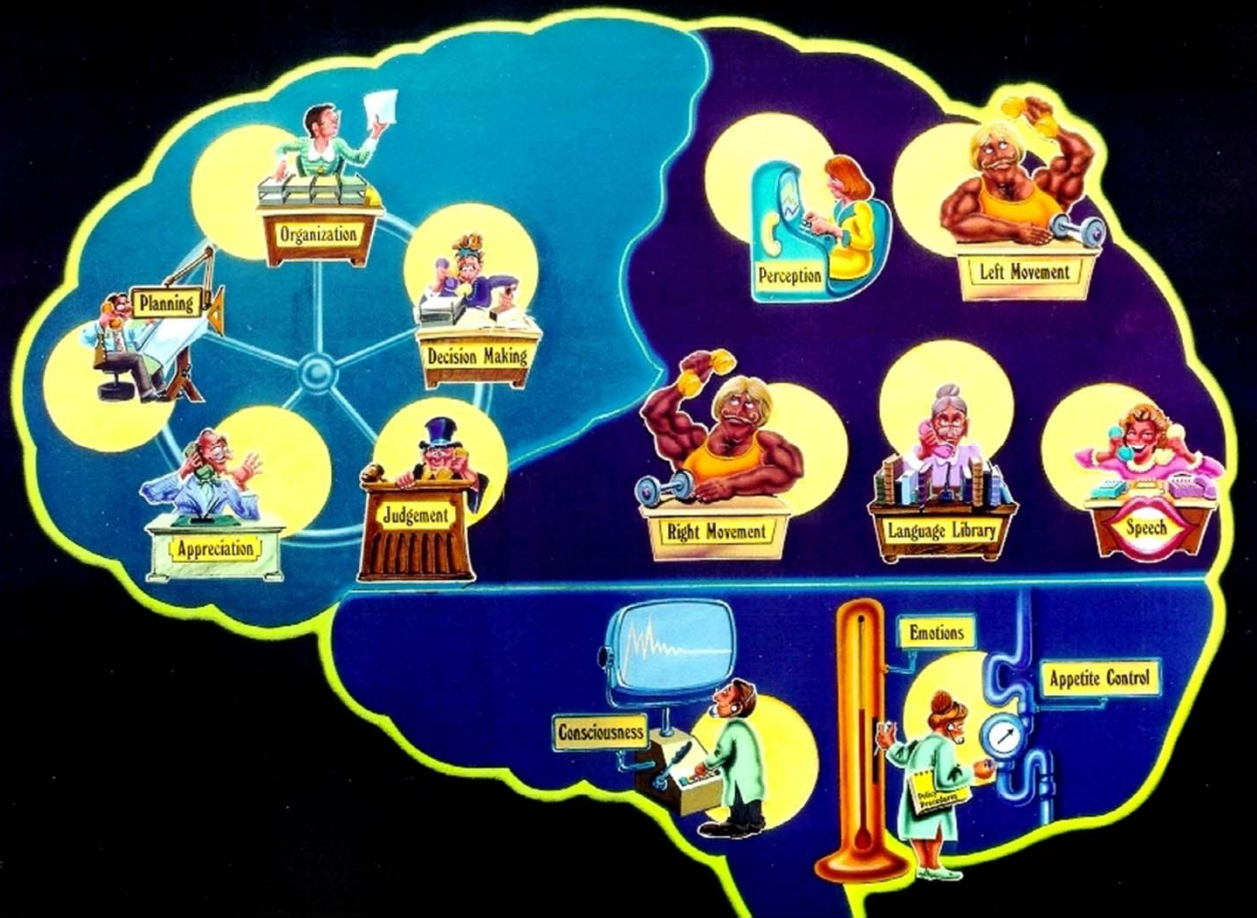
- **Dynamic**
- **Multidimensional**
 - ◆ Focal injury
 - ◆ Diffuse axonal injury
 - ◆ Diffuse microvascular injury with loss of autoregulation
 - ◆ Selective neuronal excitotoxic loss
 - ◆ Superimposed classical hypoxic-ischemic injury



COUP CONTRECOUP INJURIES



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PSYCHIATRIC SEQUELAE OF ABI

- Post-Traumatic Delirium
- Post-Concussive Syndrome
- Maladaptive Coping
- Cognitive Difficulties
- Affective Disorders
- Anxiety Disorders
- Psychotic Disorders
- Sleep Disorders
- Personality Disorders
- Behavioral Sequelae especially Aggression and Apathy
- Effects on the family

Thus, effective management has to address most of these factors at varying times



COMMON ISSUES ...




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DEPRESSION

- ↑ in Left dorso-lateral frontal and left basal ganglia damage
- Can be acute post-ABI (soon after) or late-onset (months to years)
- Acute
 - ◆ Neurophysiological or neurochemical
 - ◆ ↑ vegetative symptoms
- Late-onset
 - ◆ Psycho-social and awareness
 - ◆ ↑ psychological and somatic symptoms



ANXIETY DISORDERS

- Associated with right hemisphere lesions
- Generalized Anxiety Disorder, the most common diagnosis
- Paradoxically,  incidence in patients with mild-ABI







BIPOLAR AFFECTIVE DISORDER

- ↑ in right hemisphere lesions especially affecting baso-temporal cortex or limbic system
- Associated with ↑ prevalence of post-ABI epilepsy
- Often associated with ↑ anxiety, especially with right hemisphere lesions
- Males > Females
- ↑ in patients with moderate to severe ABI



PERSONALITY DISORDERS

-  diagnosis of:
 - ◆ borderline personality disorder
 - ◆ avoidant personality disorder
- Certain personality types are typical:
 - ◆ pseudodepressed
 - ★  in lesions of the dorsomedial aspects of the frontal lobes
 - ◆ Pseudopsychopathic
 - ★  in lesions of the orbital aspects of the frontal lobes
-  in patients with premorbid maladaptive personality



PSYCHOTIC DISORDERS

- Usually present with fragmented delusions
- Usually paranoid
- ↑ in the early post-ABI period
- In the early post-ABI period, ↑ in patients with diffuse cerebral swelling and mid-line shifts



ATTENTION DISORDERS

- Also called Secondary ADHD (SADHD) post TBI
- Described in Children. No research available in adults
- Incidence varies between 16-20%¹
 - ◆ Mainly inattentive. Rarely hyperactive
- Pre-injury risk factors poorly understood
- No definite relationship of SADHD to injury severity
 - ◆ In fact, mild TBI may lead to increased risk
- Lesions of the Putamen, basal ganglia, thalamus, orbito-frontal cortex and pre-frontal cortex possibly associated with increased risk of SADHD
- Co-morbid with Personality Change due to TBI, ODD, CD, Disruptive Behavior Disorder
- Not associated with new onset Depressive or Anxiety Disorder



Max, J et al, Journal of the American Academy of Child & Adolescent Psychiatry; 44 (10), October 2005

IS ADHD A FACTOR?

- SADHD may occur in 16-20% of patients
- However, inattentiveness and attentional disorders occur in a vastly greater % of patients. Possibly due to:
 - ◆ The apathy and anhedonia of the ABI itself
 - ◆ Neuropsychiatric syndromes causing or exacerbating attention disorders:
 - ★ Personality Change, Depression, Anxiety, Psychotic Disorder
 - ★ Substance Use / Abuse
 - ★ Pain syndromes and it's management
 - ★ Sleep Disorders
 - ◆ Iatrogenic Syndromes



Max, J et al, Journal of the American Academy of Child & Adolescent Psychiatry; 44 (10), October 2005

SLEEP DISORDERS

- 46 % of Traumatic Brain Injury patients have sleep disorders
 - ◆ 23% Obstructive Sleep Apnea
 - ◆ 11% Post-Traumatic Hypersomnia
 - ◆ 6% Narcolepsy
 - ◆ 7% Periodic Leg Movements in Sleep
- 25% Excessive Daytime Sleepiness
- Sleepy subjects had a greater body mass index (BMI) than those who were not sleepy ($p = 0.01$)
- OSA was more common in obese subjects ($BMI \geq 30$, $p < 0.001$)



Seyone and Kara, Head Injuries and Sleep, Sleep and Sleep Disorders, Landes Biosciences, 2006

- Comparisons of sleep-disordered versus non-sleep-disordered subjects disclosed no relationship between the presence of a sleep disorder and injury severity, cause of injury, or the presence of positive CT scan findings
- Consider other psychiatric diagnoses that may contribute to sleep problems (e.g. depression, anxiety, psychosis)
- Consider Iatrogenic Sleep disorders (e.g. medications)
- Timing of sleep disturbances in ABI patients:
 - ◆ 72.7% of a cohort of 22 inpatients with ABI manifested sleep disorders 3-5 months post injury while another 51.9% of 77 patients had sleep complaints even after 29.5 months since the injury (Cohen et al., 1992),
- A distinction was present in that early post injury patients had difficulty initiating and maintaining sleep, while late post injury patients had a preponderance of excessive somnolence during the day.



Castriotta et al, 2007

AGGRESSION

- Immediately post-ABI (35-96%)
- <2 wks. to 4-6 wks.
 - ◆ ? = Posttraumatic amnesia plus excess of behavior such as aggression, disinhibition, and/or emotional lability
 - ◆ ? = Post-traumatic delirium
- As a longer term sequela (severe TBI – 31-71%; mild TBI – 5-70%)
 - ◆ After the acute recovery phase
 - ◆ Days, weeks, months, years later



NEUROPATHOLOGY

■ Hypothalamus

- ◆ Orchestrates neuroendocrine response via sympathetic arousal
- ◆ Monitors internal status

■ Limbic System

- ◆ Amygdala
 - ★ Activates and/or suppresses hypothalamus
 - ★ Inputs from neocortex

■ Temporal Cortex

- ◆ Associated with aggression in both ictal and interictal states

■ Frontal Neocortex

- ◆ Modulates limbic and hypothalamic activity
- ◆ Associated with social and judgment aspects of aggression



NEUROCHEMISTRY

■ Norepineprine



■ Serotonin



■ Dopamine



■ Acetylcholine



FEATURES OF AGGRESSION IN ABI

- **Reactive**
 - ◆ Triggered by modest or trivial stimuli
- **Nonreflective**
 - ◆ Usually does not involve premeditation or planning
- **Nonpurposeful**
 - ◆ Serves no obvious long-term aims or goals
- **Explosive**
 - ◆ Buildup is not gradual
- **Periodic**
 - ◆ Brief outbursts of rage and aggression punctuated by periods of relative calm



BEHAVIOURAL SYNDROMES

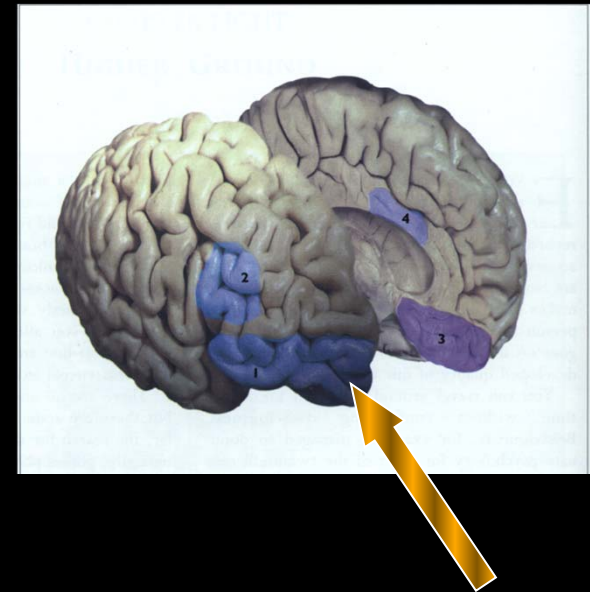


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ORBITOFRONTAL SYNDROME

“Behavioural excess”

- Impulsivity
- Hyperactivity
- Lability
- Psychomotor hyperactivity
- Aggression

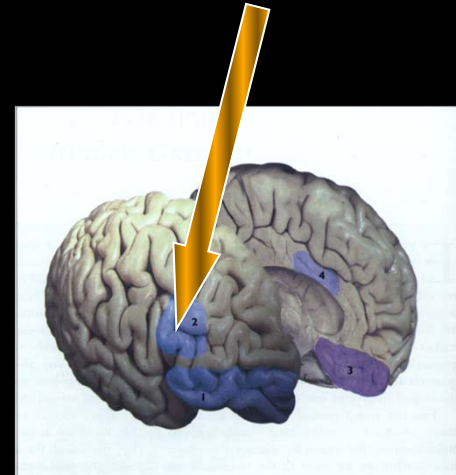


Impulsive / Aggressive

DORSOLATERAL FRONTAL SYNDROME

“Slow” syndrome

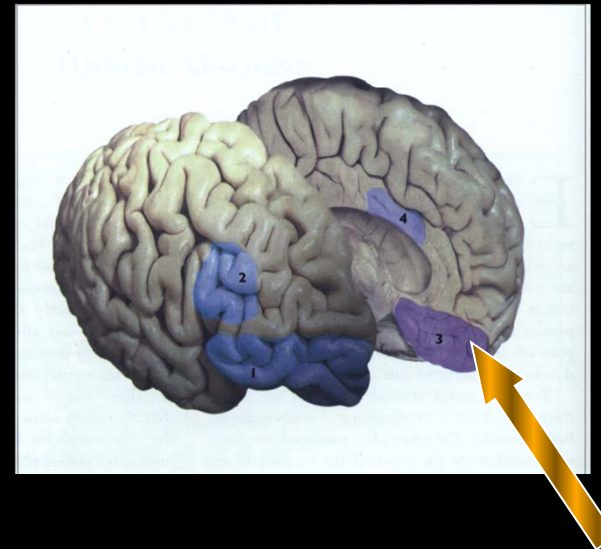
- Inattentive
- Poor judgment
- Perseveration
- Psychomotor retardation
- Passivity
- Blunt affect
- Disorganized
- Rigid
- Concrete



Dysexecutive

VENTRO-MEDIAL FRONTAL SYNDROME

- Apathy
- Poor initiation
- Poor follow through



Apathetic / Abulic

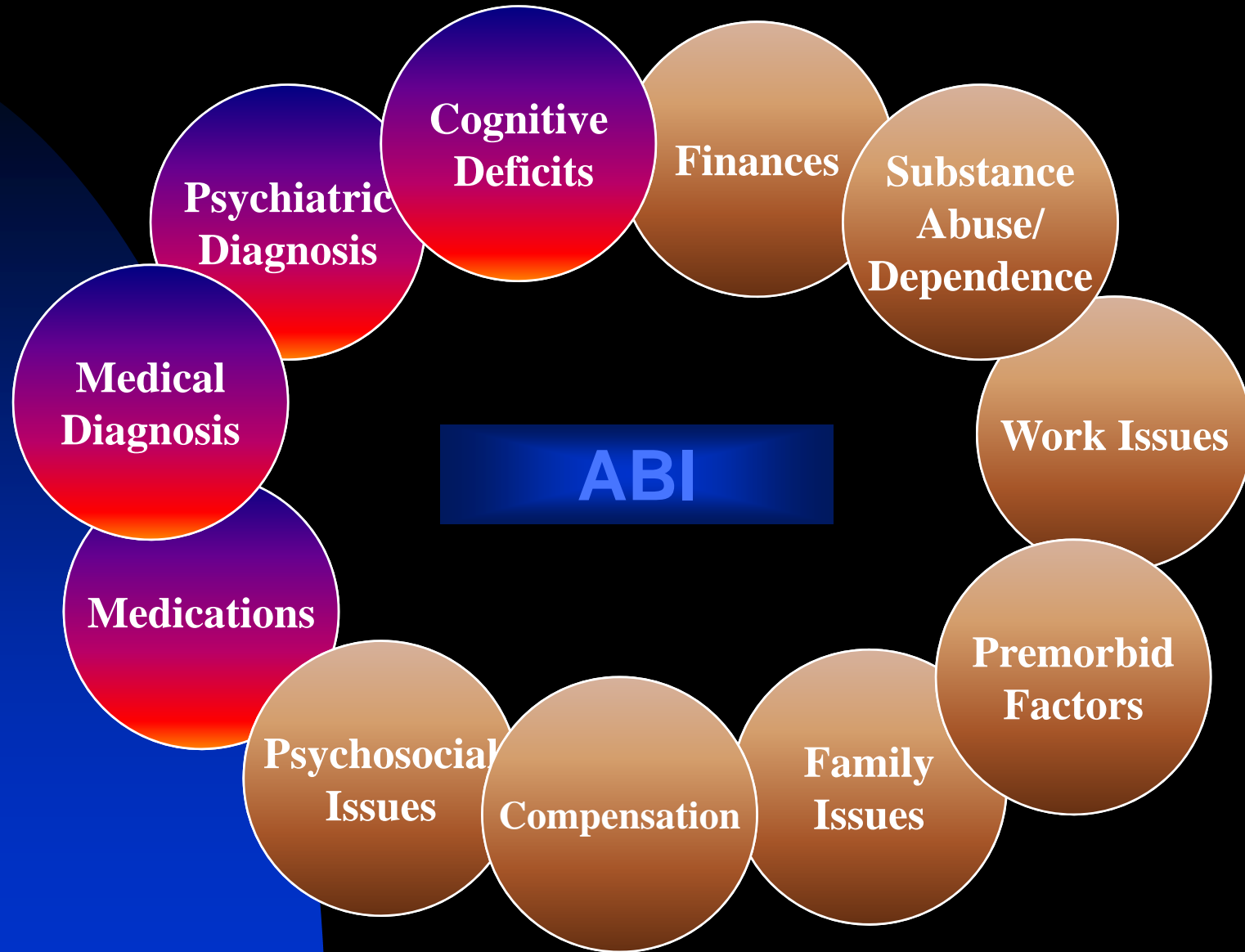
MANAGEMENT

- Psychopharmacological Management by itself is generally futile. It needs to be part of a:
 - ★ Team Approach
 - ★ Patient is at the center of coordinated care
 - ★ Individualized



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Why?



INITIAL MANAGEMENT

- Without a proper understanding of the patient and family / environmental dynamics, the chances of successful treatment are slim. Therefore, do a:
 - ◆ Thorough case review
 - ★ Medical, educational, social
 - ◆ Assess current and past level of functioning
 - ★ competency-treatment and financial
 - ★ daily living skills
 - ★ cognitive ability
 - ★ social skills
 - ★ behavioral issues
 - ★ family and social relationships
 - ★ recreational activities
 - ★ employment interests and abilities



FOLLOW UP MANAGEMENT - TO DEAL WITH:

- **Aggression and agitation**
 - ◆ teach alternative acceptable behavior, develop contingencies, medications
- **Disinhibition and sexual inappropriateness**
 - ◆ develop acceptable outlets, recreational workshops
- **Passivity**
 - ◆ address fatigue, if any, reinforce social groups and activities, medications
- **Attentional disorders**
 - ◆ instructions, reinforcements and prompts, medications
- **Memory deficits**
 - ◆ spaced-retrieval technique, daily planners
- **Psychiatric syndromes of depression, psychosis, anxiety**
 - ◆ medications
- **Poor patient-family interaction**
 - ◆ encourage social skills training, family therapy
- **Finances**
 - ◆ obtain financial assistance from appropriate sources
- **Housing**
 - ◆ help patient get and keep accommodation



MEDICATIONS

- **Antidepressants**
 - ★ SSRI, SNRI, RIMA, TCS, MAOI
- **Anxiolytics**
 - ★ Benzodiazepines, Buspirone
- **Neuroleptics**
 - ★ High Potency, Low Potency, Mid Potency, Atypical, New
- **Sedative Hypnotics**
 - ★ Benzodiazepines, Zopiclone
- **Anticonvulsants**
- **Stimulants**
 - ★ Methylphenidate, Atomoxetine,



COMMON SIDE EFFECTS OF MEDICATIONS

Dependent on:

- Group of Medication
- Dose of Medication
- Route of Administration
- Patient Profile
- Drug Interaction
- Unknown factors...
 - ★ *idiosyncratic reactions*



MAIN SIDE EFFECTS TO BE CONCERNED ABOUT:

■ Neuroleptics:

- ★ Acute Dystonic Reaction
- ★ Akathisia
- ★ Extra Pyramidal Symptoms (EPS)
- ★ Tardive Dyskinesia

■ Others:

- ★ GI upset
- ★ Insomnia / Hypersomnia
- ★ Postural Instability and Falls
- ★ Incontinence
- ★ Sexual Dysfunction ...

■ Stimulants:

- ★ Akathisia
- ★ Irritability and Aggression
- ★ ? Potential for abuse



PSYCHOPHARMACOLOGY OF AGGRESSION

■ Acute Aggression

◆ Antipsychotics

- ★ Especially atypical - Risperidone (up to 6 mg/day), Olanzapine (unto 20 mg/day)
- ★ Side effects
 - Over-sedation, weight gain, drooling, decreased seizure threshold ...

◆ Benzodiazepines

- ★ Especially Clonazepam (unto 2-3 mg/day)
- ★ Side effects
 - Over-sedation, cognitive deterioration (memory), postural instability, disturbed coordination, paradoxical rage or disinhibition ...



■ Chronic Aggression

◆ Anticonvulsants

- ★ Especially Carbamazepine, Valproic Acid (Dose as per blood levels)
- ★ Side effects - Bone marrow suppression, hepatotoxicity

◆ Lithium - (Dose as per blood levels)

- ★ Side effects - Neurotoxicity, confusion

◆ Buspirone

- ★ Side effects - Delayed onset of action

◆ Beta blockers

- ★ Propranolol, Atenolol
- ★ Side effects - Latency of 4-6 weeks

◆ Antidepressants

- ★ Newer medications preferred – Zoloft, Effexor, Wellbutrin
- ★ Side effects – Headache, Sweating, GIT upset

◆ Anxiolytics

- ★ Benzodiazepines – Clonazepam

◆ Antipsychotics

- ★ Newer medication preferred – Risperidone, Olanzapine



CASE PRESENTATION

- Shane P.
- Male / 45 years old (DOB: 16/05/1968)
- Former black belt in Karate
- MVA > 20 years ago
- ABI – Severe
- Aphasic – Receptive and Expressive
- Cannot communicate needs / wants
- Diabetic – Brittle
- Severe Behavioral issues – Aggression especially during care routines
- Incontinent – both urinary and fecal
- Highly tolerant and resistant to medications
- Behavioral programs very difficult if not impossible
- Currently in a locked community institution
- Was in a locked, padded room in hospital for a number of years
- Now has a much improved quality of life – able to go accompanied outside in the community



Shanè's Current Medications



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ALLERGIES: Azithromycin, Lactose

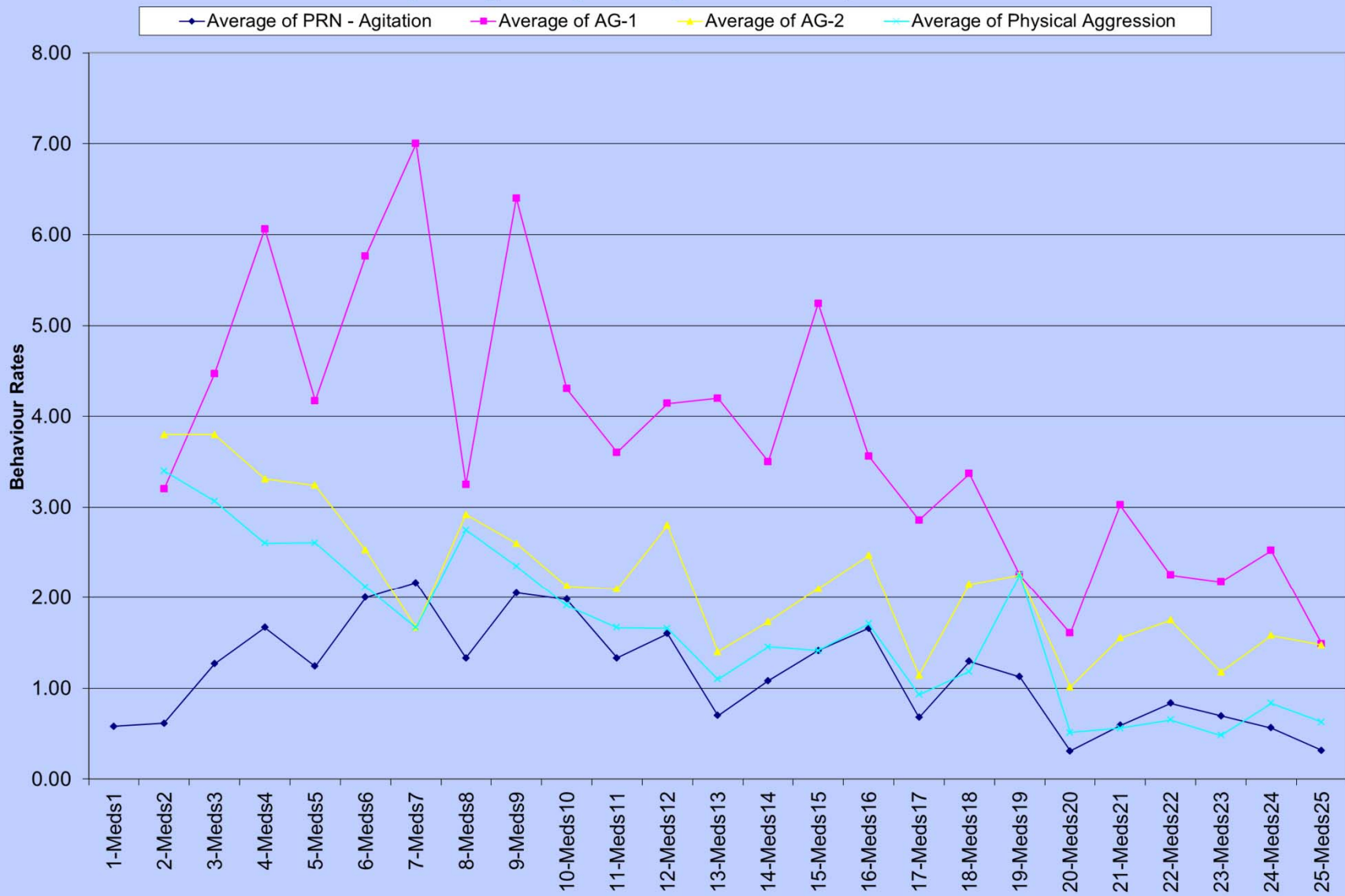
MEDICATION	DOSAGE PER INTAKE	FREQUENCY	RATIONALE
APO-CARBAMAZAPINE	300 mg = 1 ½ Tablets	300 mg @ 8:00 a.m. (0800 hrs.) 300 mg @ 12:00 p.m. (1200 hrs.) 300 mg @ 5:00 p.m. (1700 hrs.) 300 mg @ 9:00 p.m. (2100 hrs.)	Behaviour Management
SEROQUEL XR	200 mg = 1 Tablet	200 mg @ 8:00 a.m. (0800 hrs.) 200 mg @ 12:00 p.m. (1200 hrs.) 200 mg @ 5:00 p.m. (1700 hrs.) 200 mg @ 9:00 p.m. (2100 hrs.)	Behaviour Management
APO-DIAZEPAM	7.5mg= 1 ½ Tablets	7.5 mg @ 8:00 a.m. (0800 hrs.) 7.5 mg @ 12:00 p.m. (1200 hrs.) 7.5 mg @ 5:00 p.m. (1700 hrs.) 7.5 mg @ 9:00 p.m. (2100 hrs.)	Behaviour Management
ZYPREXA	7.5 mg = 2 Tablets (1 tab = 5mg/1 tab = 2.5mg)	7.5 mg @ 8:00 a.m. (0800 hrs.) 7.5 mg @ 12:00 p.m. (1200 hrs.) 7.5 mg @ 5:00 p.m. (1700 hrs.) 7.5 mg @ 9:00 p.m. (2100 hrs.)	Behaviour Management
HUMALOG	AS PER SLIDING SCALE	After breakfast, lunch & dinner	Diabetes Management
LANTUS	25 UNITS	25 UNITS @ 10:00 p.m. (2200 hrs.)	Diabetes Management
APO-BENZTROPINE	2 mg = 1 Tablet	2 mg @ 8:00 a.m. (0800 hrs.) 2 mg @ 5:00 p.m. (1700 hrs.)	Tremors
TECTA	40 mg	40 mg @ 8:00 a.m. (0800hrs)	Acid Reflex
SYNTHROID (ELTROXIN)	200 mcg = 1 Tablet 25 mcg = 1 Tablet	225 mcg @ 8:00 a.m. (0800 hrs.)	Thyroid
ABILIFY	2mg = 1 Tablet	2 mg @ 8:00 a.m. (0800) 2 mg @ 12:00 p.m. (1200) 2 mg @ 5:00 p.m. (1700) 2 mg @ 9:00 p.m. (2100)	Behaviour Management
MULTIVITAMIN	1 Tablet	1 Tablet @ 8:00 a.m. (0800 hrs)	Supplement
VITAMIN D	1000 iu = 1 Tablet	1000 iu @ 8:00 a.m. (0800 hrs.)	Supplement
DOMPERIDONE	10 mg = 1 Tablet	10 mg @ 8:00 a.m. (0800 hrs.) 10 mg @ 12:00 p.m. (1200 hrs.) 10 mg @ 5:00 p.m. (1700 hrs.)	Nausea
SODIUM CHLORIDE	1 capsule = 1 gram	1 g @ 8:00 a.m. (0800hrs)	Sodium
METAMUCIL (Mucillium)	15cc	15cc @ 9:00 a.m. (0900 hrs.)	Bowel Management

MEDICATION	DOSAGE PER INTAKE	FREQUENCY	RATIONALE
GLUCAGON INJECTION		<u>PRN</u> - IF CBS<4 AFTER 1 HOUR OF ADMINISTERING DEXTROSOL	Diabetes Management
DEXTROSOL (Or 1 tbsp of honey)	13.4 mg=4 Tablets	<u>PRN</u> - IF CBS less than 4	Diabetes Management
DIAZEPAM 5 mg	5 mg = 1 Tablet	<u>PRN- LEVEL 1 FOR BEHAVIOURS</u> 5 mg EVERY 1HR, MAX OF 20 mg IN 24 HRS. Administer Lorazepam as prescribed if Maximum dose is reached and Shane continues to meet criteria for PRN admin.	Behaviour Management
APO-LORAZEPAM	2.0 mg	<u>PRN- LEVEL 2 FOR BEHAVIOURS</u> 2 mg EVERY 1HR, MAX OF 16MG IN 24 HRS. Administer after maximum dose of Diazepam has been administered and Shane continues to meet criteria for PRN admin. <u>FIRST DOSE IS 4 mg</u>	Behaviour Management
APO-ACETAMINOPHEN 500 MG=1 TABLET	1-2 Tablets	<u>PRN</u> – 1-2 tablets twice daily for pain.	Pain Management
LACTULOSE	30cc	<u>PRN</u> – No BM for 24 hours	Bowel Management
TYLENOL (ACETOMINAPHEN)	1000mg = 2 tabs	<u>PRN</u> – 2 tablets every 6 hrs to a maximum of 6 tablets in 24hrs when Shane presents with symptoms of a fever	Fever
FUCIDIN OINTMENT		<u>PRN</u> – Apply to small wounds/abrasions as needed	
SYSTANE BALANCE EYE DROPS	1 drop in each eye	<u>PRN</u> – as needed for dryness around eyes	Dryness around Eyes

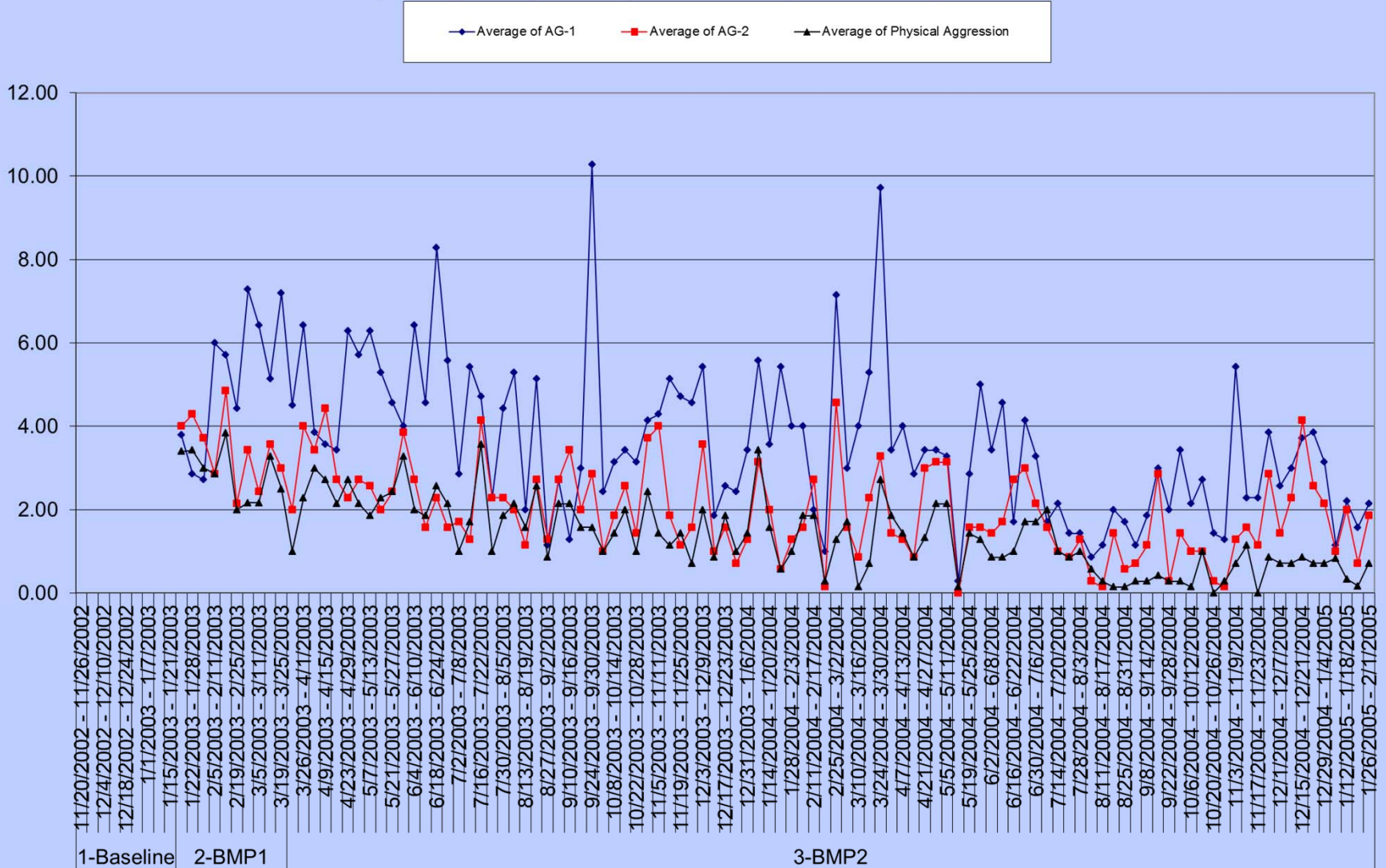
20-Nov-02	1-Meds1	Synthroid - 0.112 mg	1-PRN1	Humulin R - 5 units qAM
		Sulfasolazine - 2000 mg		Dextrosol 13.4g po
		Apo-Lisinopril - 5 mg		Glucagon - 1 mg injection
		Apo-Fluoxetine - 10 mg		
		Apo-Clonazepam - 4.5 mg		Apo-Lorazepam 0.5-2.0 mg
		Apo-Acetaminophen - 1300 mg		, max 8 mg/12 hrs.
		Nozinan - 30 mg		
		Lamictal - 50 mg		
		Humulin R - 4 units		
		Humulin NPH - 10 units		
		Novalin 40/60- 40 units		
		Peg-Lyte - 5 ml q 2 days		
		Cran-Max - 15000 mg		
14-Jan-03	2-Meds2	Synthroid - 0.112 mg	1-PRN1	Humulin R - 5 units qAM
		Sulfasolazine - 2000 mg		Dextrosol 13.4g po
		Apo-Lisinopril - 5 mg		Glucagon - 1 mg injection
		Apo-Fluoxetine - 10 mg (Discontinued)		
		Seroquel 200 mg (Added)		Apo-Lorazepam 0.5-2.0 mg
		Apo-Clonazepam - 4.5 mg		, max 8 mg/12 hrs.
		Apo-Acetaminophen - 1300 mg.		
		Nozinan - 30 mg		
		Lamictal - 50 mg		
		Humulin R - 4 units		
		Humulin NPH - 10 units		
		Novalin 40/60- 40 units		
		Peg-Lyte - 5 ml q 2 days		
		Cran-Max - 15000 mg		

27-Apr-05	25-Meds25	Synthroid - 0.112 mg	3-PRN3	Dextrosol 13.4g po
		Sulfasalazine - 2000 mg		Glucagon - 1 mg injection
		Apo-Lisinopril - 5 mg		
		Seroquel 2400 mg		Apo-Diazepam 5.0 mg po every
		Apo-Lorazepam 3.0 mg		1 hour, max 20 mg/24 hrs
		Effexor XR- 450 mg		then
		Apo-Acetaminophen - 1300 mg.		Apo-Lorazepam 2.0 mg po every
		Apo-Diazepam 15.0 mg		1 hour, max 16 mg/24 hrs.
		Apo-Carbamazepine - 900 mg		
		Apo-Benztropine - 2 mg (added)		
		Humulin R - Sliding Scale		
		Humulin NPH - 14 units bds		
		Peg-Lyte - 5 ml q 2 days		
	26-Meds26	Synthroid - 0.112 mg	3-PRN3	Dextrosol 13.4g po
		Sulfasalazine - 2000 mg		Glucagon - 1 mg injection
		Apo-Lisinopril - 5 mg (discontinued)		
		Seroquel 800 mg (decreased)		Apo-Diazepam 5.0 mg po every
		Apo-Lorazepam 3.0 mg (discontinued)		1 hour, max 20 mg/24 hrs
		Effexor XR- 450 mg (discontinued)		then
		Apo-Acetaminophen - 1300 mg (discontinued)		Apo-Lorazepam 2.0 mg po every
		Apo-Diazepam 15.0 mg		1 hour, max 16 mg/24 hrs.
		Apo-Carbamazepine - 600 mg (decreased)		
		Apo-Benztropine - 4 mg (increased)		
		Humulin R - Sliding Scale (discontinued)		
		Humulin NPH - 10 units bds (decreased)		
		Humalog- Sliding Scale (added)		
		Peg-Lyte - 5 ml q 2 days (discontinued)		
		Zyprexa - 30 mg (added)		
		Apo-Erythro Base - 1000 mg (added)		
		Pantoloc - 80 mg (added)		
		Apo-Metoclopr - 40 mg (added)		

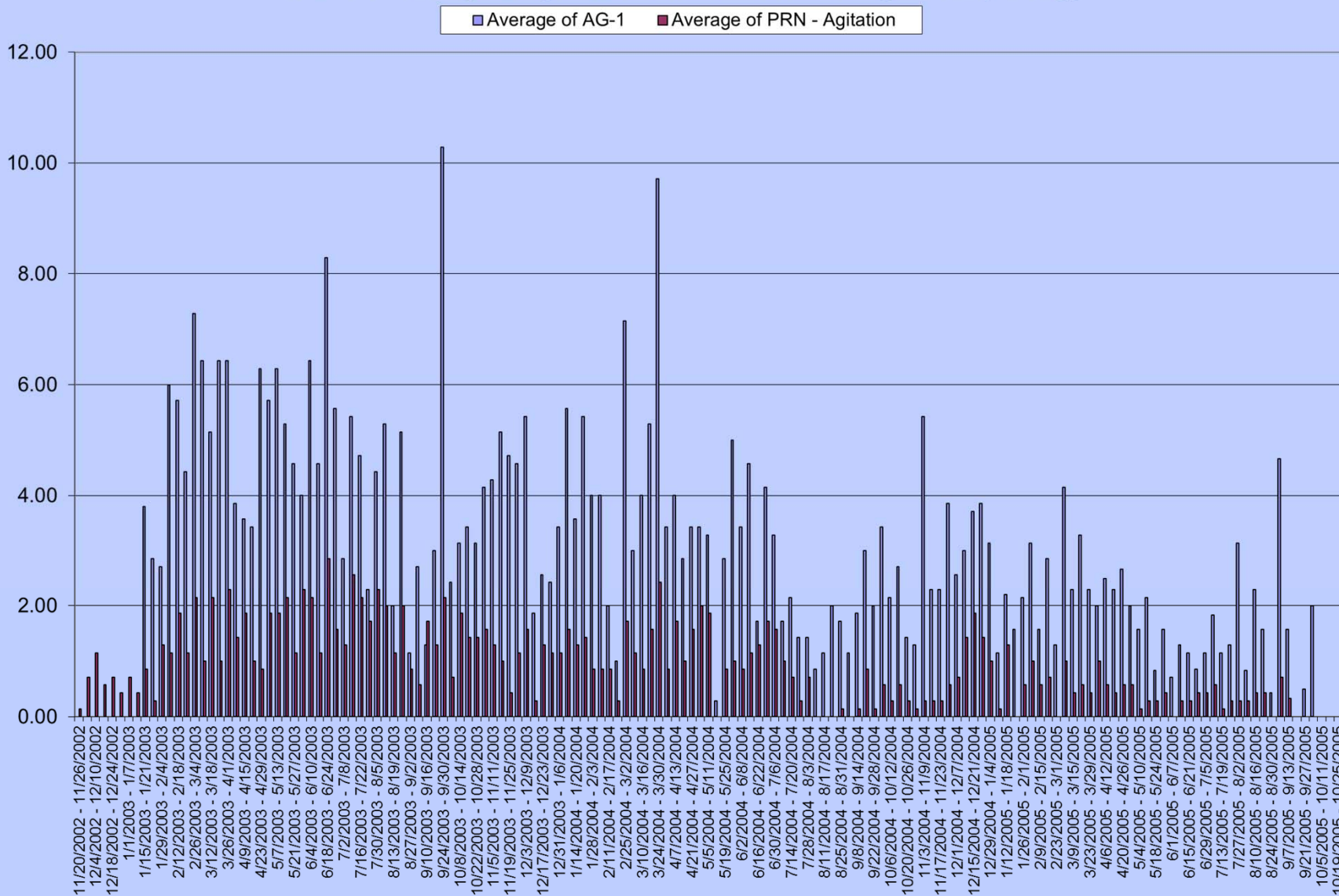
Shane P.- Daily Average of Negative Target Behaviours by Medication Condition



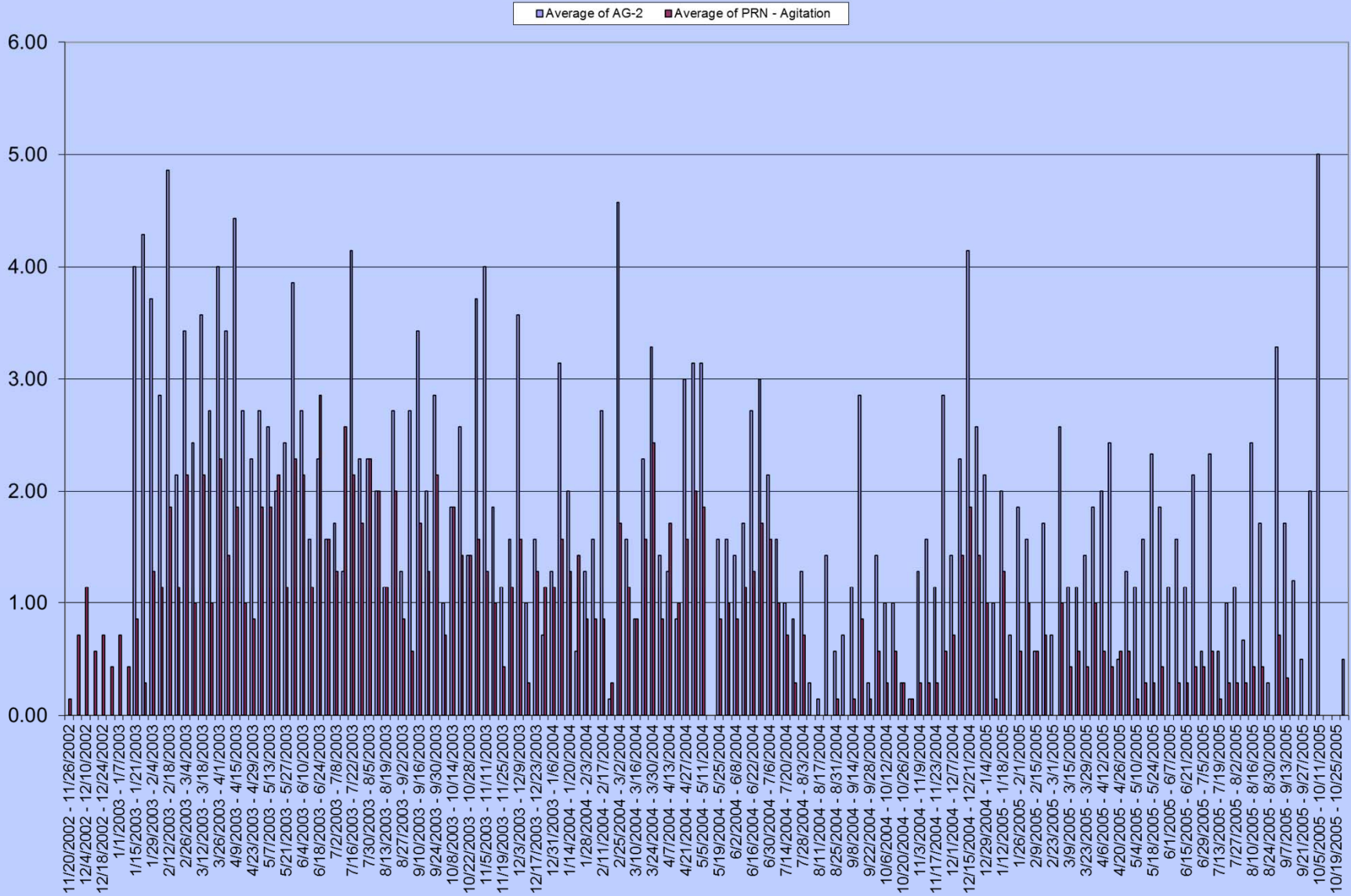
Shane P.- Daily Average of Negative Target Behaviours by Weeks & Programme Condition



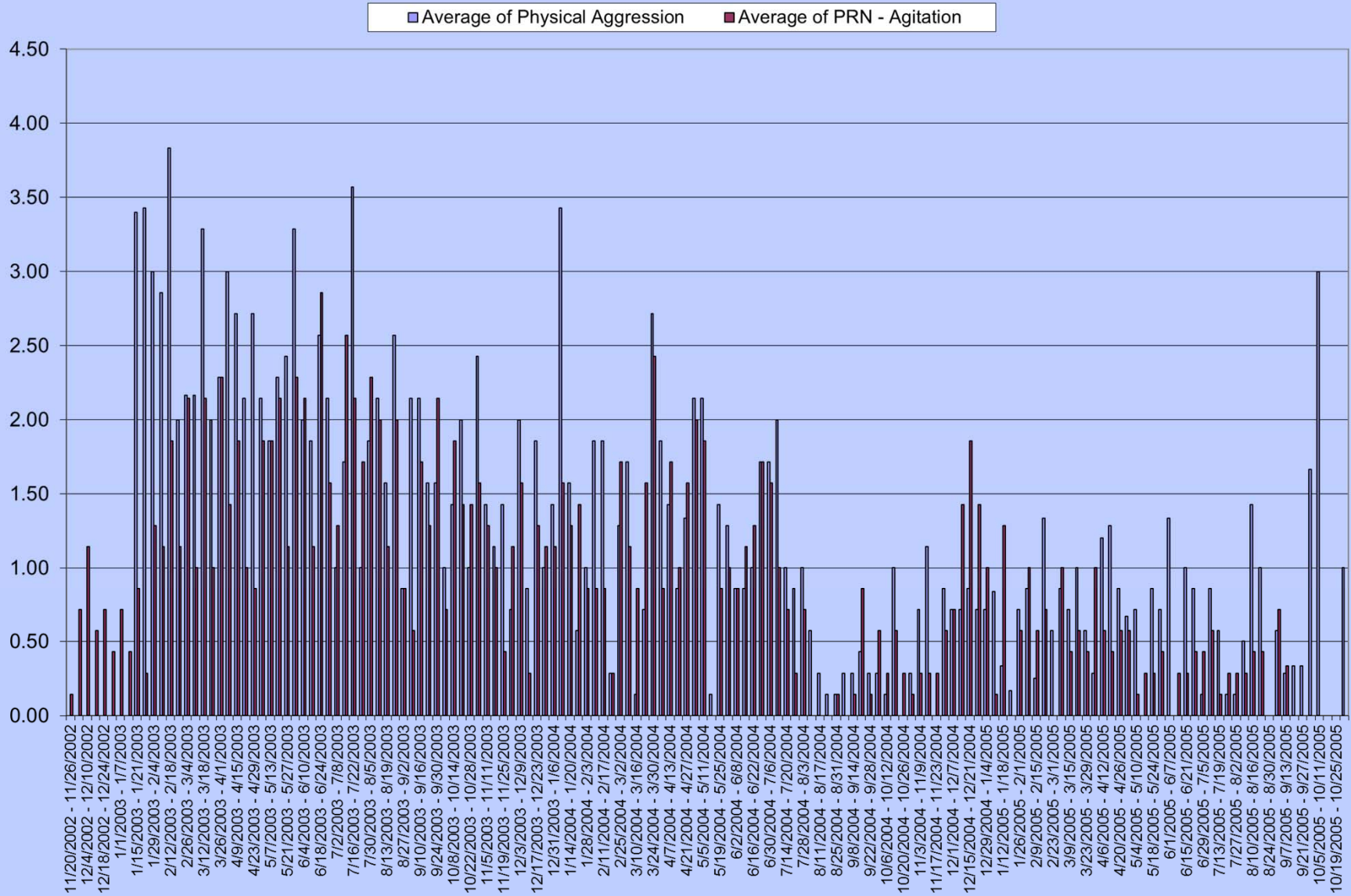
Shane P.- Average Daily Rate of AG-1 and PRN for Agitation- (Weekly)



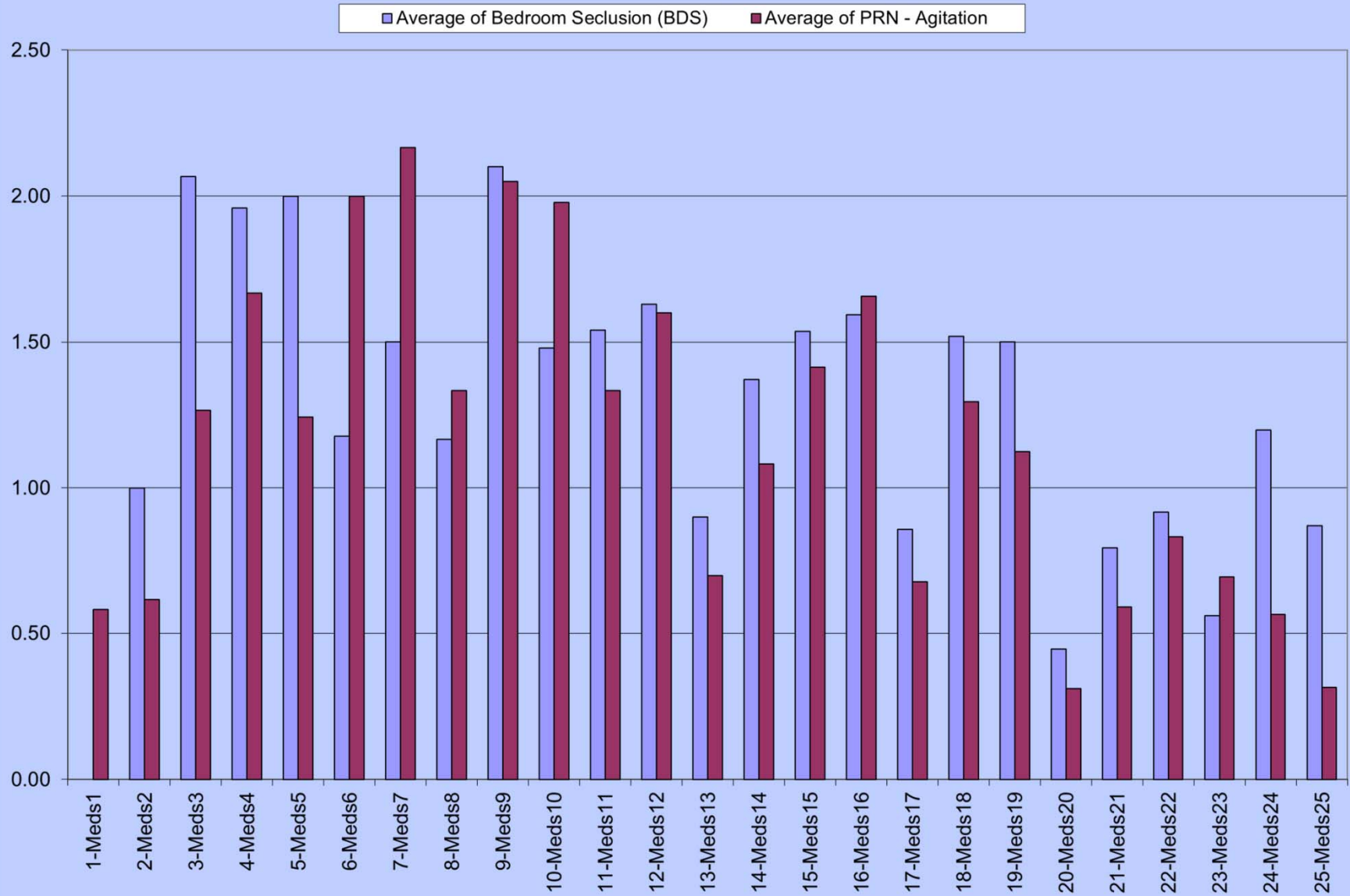
Shane P.- Average Daily Rate of AG-2 and PRN for Agitation- (Weekly)



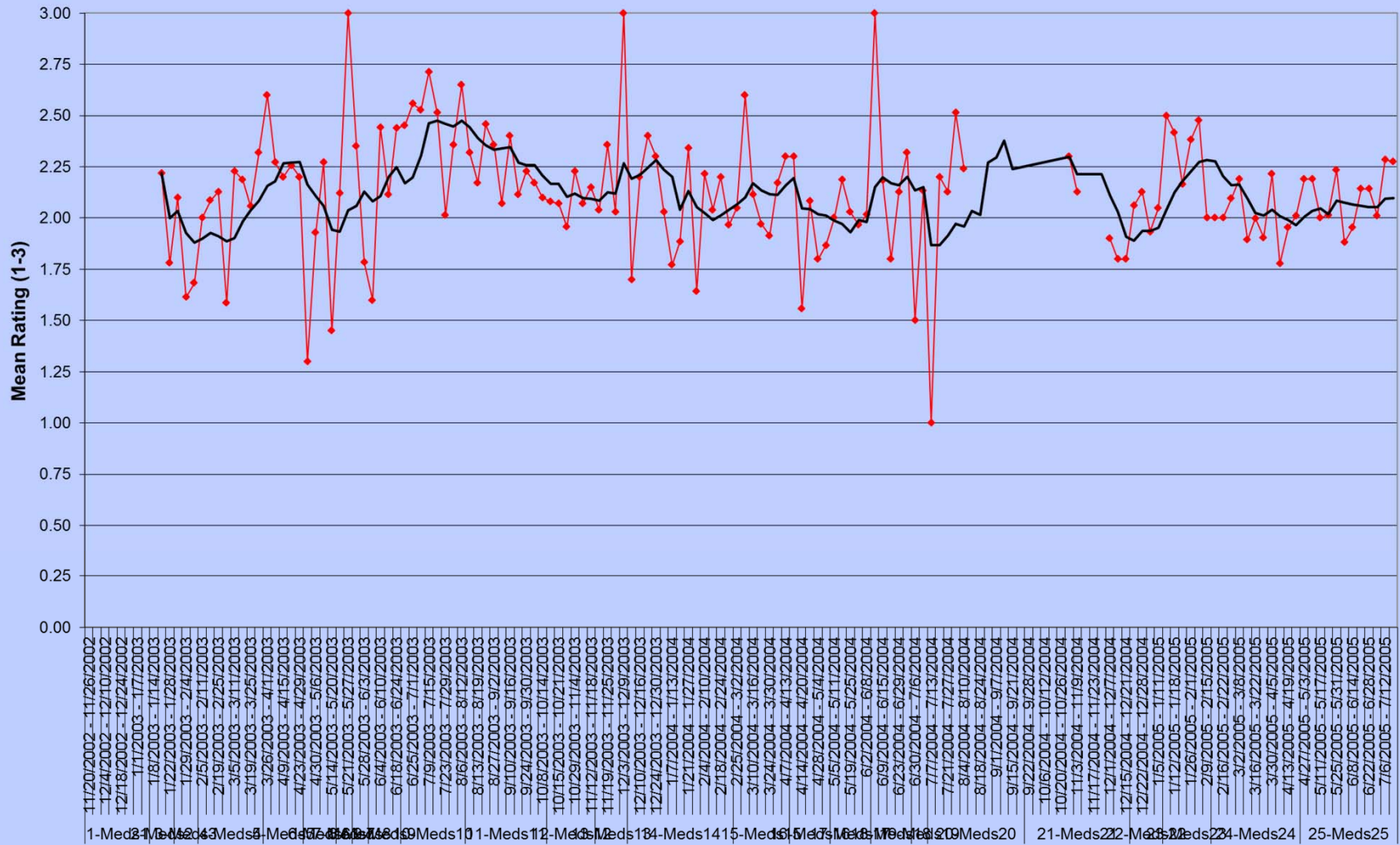
Shane P.- Average Daily Rate of Physical Aggression and PRN for Agitation



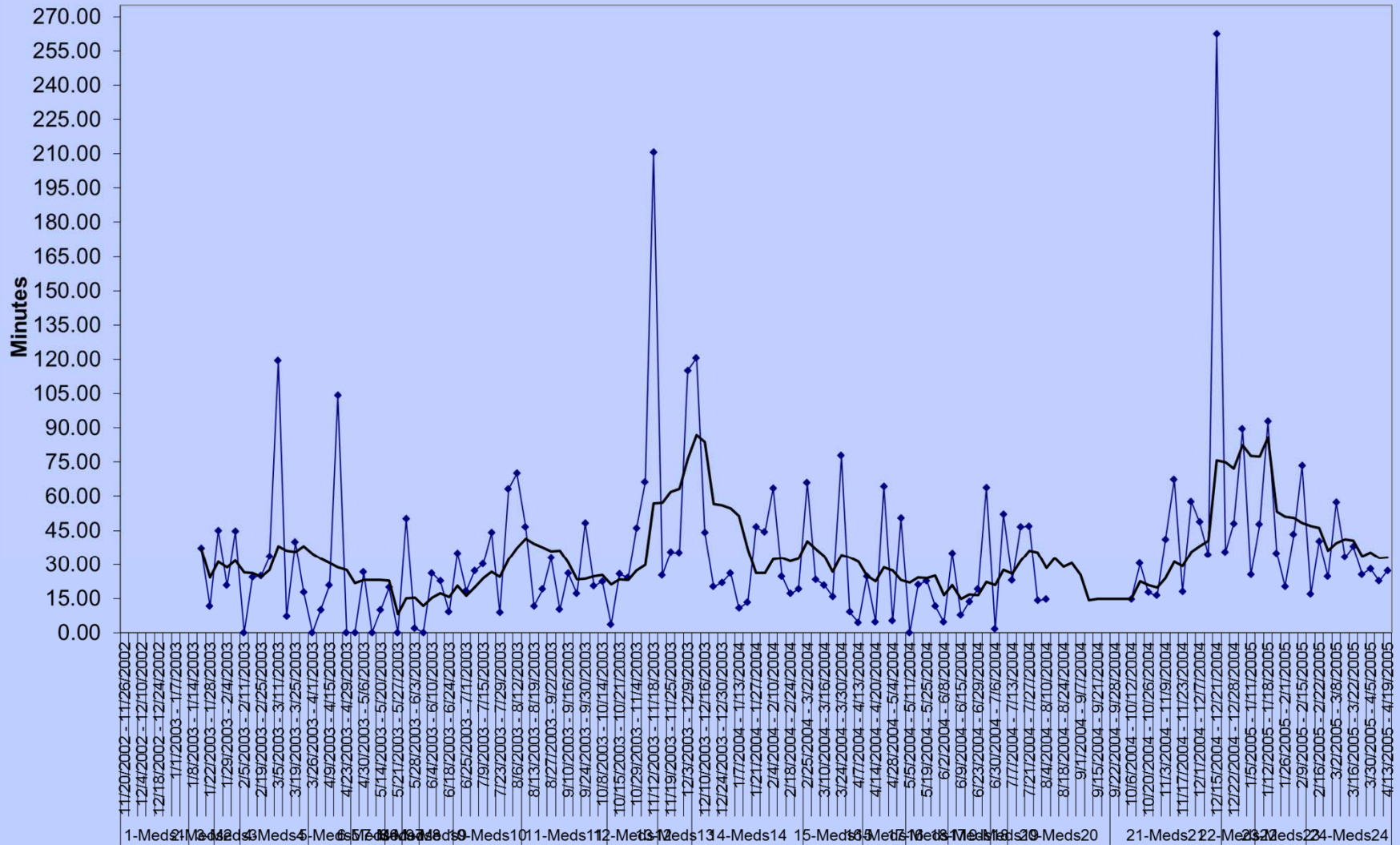
Shane P.- Average daily Rate of Bedroom Seclusion (15 min. intervals) by Medication Condition



Shane P.- Daily Average Level of Awareness Probe (1-3)- Morning



Shane P.- Daily Average of Over-night Awake (min)



Easy, isn't it?



September 12th, 2013

One other thing !



September 12th, 2013

Physical Signs of Stress

- Headaches, migraine, stomach aches
- Muscle tension
- Stomach ulcers
- Faster heartbeat
- Sleep disruption
- Loss of appetite or overeating
- Sweaty palms
- Trembling
- Chronic fatigue

Emotional Signs of Stress

- Anxiety and being bad-tempered
- Excessive worrying, moody
- Sadness, fear
- Feeling inadequate

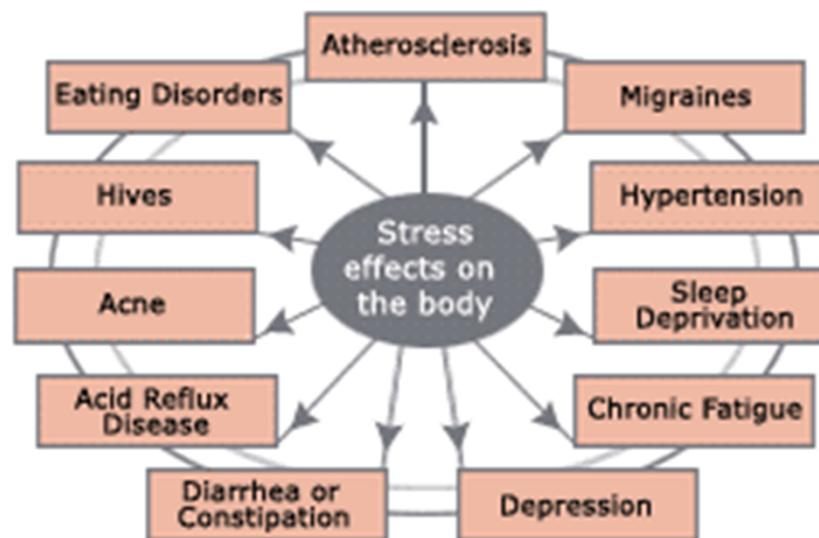
Mental Signs of Stress

- Poor concentration
- Forgetfulness
- Lack of confidence

Behavioural Signs of Stress

- Acting in a defensive, aggressive or impulsive manner
- Nervous habits (e.g. stammering or biting nails)
- Loss of interest in activities
- Avoidance of tasks
- Easily distracted
- Withdrawing from social activities
- Drinking or smoking excessively

**Tension is who you think you should be.
Relaxation is who you are.**
Chinese Proverb



*Look for psychopathology in
caregivers and help them!*



September 12th, 2013

THERAPIES

- Behavior therapy to identify triggers and modify responses
- Cognitive therapy to identify and modify thoughts and feelings
- Supportive and individual therapy to identify environmental and social needs



Thank you.

Any Questions?



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