

## A SUBTLE THREAT. POST-TBI PITUITARY FAILURE AS VIEWED BY ENDOCRINOLOGY, NURSING AND THE PATIENT.

THE PERSPECTIVE FROM THE NURSE AND THE PATIENT.

### NURSE AND MOTHER

- Worked as a Trauma Nurse and Trauma Nurse Manager
- Educator for Nurses in the Neuro Intensive Care Unit
- Nurse for Patient with a severe TBI since 2005



### BEFORE.

#### A BRILLIANT MIND

- Sam was studying medicine at MSU
- Won ISEF
- Studied Lymphomatoid Papulosis (LyP)
- Harvard Medical and Dr. Marshall Kadin
- Eagle Scout
- Symphony Percussionist
- Soccer Captain
- Voted Sexiest Legs and Biggest Flirt



### AFTER.

#### COMA AND REHABILITATION.

- 3 Month coma
- 7 months at St. Joseph's in Ypsilanti
- Unable to speak, eat, walk



### Initial Presentation during ICU Crisis.


- Low Sodium
- High Urine Output (>1000 cc hour)
- Inability to Maintain Blood Pressure
- Pseudo-gout

### PSEUDOGOUT

- Pseudogout and joint injury
- Pseudogout and severe hypothyroidism.



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### 4 A.M. THE NIGHT BEFORE:

- Cadaver study 2005
- A 2015 another article spoke of autopsy studies where up to one-third of patients with a fatal head trauma had anterior pituitary gland necrosis

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### That next morning...

- Cortisol and thyroid profile were drawn.
- IV cortisone was administered
- 4 IV blood pressure medications were weaned

### February 2005

At the time of Sam's accident, there was very little attention paid to the pituitary and TBI.

Research had been going on, but had not impacted ICU treatment level.

Risk factors for pituitary damage:

- SAH, intercranial hemorrhage
- Basilar fracture/skull bone fracture
- Neurosurgical Intervention
- Hypoxia
- Hypotension

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### REHABILITATION

- Replacement steroids, testosterone, levothyroxine
- Hypotensive
- Tachycardia
- Febrile
- Tilt table failure

○ Endocrinology agreed Sam needed stress-level cortisol.  
 This was the first day his dose was doubled.  
 He finally had success on the tilt table.




### AFTER DISCHARGE FROM ST JOSEPH'S

- Massachusetts General Hospital/Harvard
- Pituitary Center
- Dr. Lisa Nachtigall
- U of M Hospital and Dr. Craig Jaffe

### RECOVERY

Sam's potential for meaningful recovery was dismal. However, he has surprised everyone with his determination to regain his life.

One major challenge throughout recovery has been management of his panhypopituitarism.



### PITUITARY FAILURE CAN BE TRICKY

- Post seizure.
- Illness/stress
- Three seizures in 12 years
- Insight by Sam
- Assessment
- Caution about over medicating



### WARNING SYMPTOMS

Sam has identified warning symptoms of an impending crisis.

- "Cold and Scared"
- "Peeing like a race horse"
- "Loosing it-passing out"

Other patients have had similar symptoms.

### SIGNS OF IMPENDING ADRENAL CRISIS

- ELEVATED URINE OUTPUT/DEHYDRATION
- ELEVATED TEMPERATURE/HEART RATE
- LOW BLOOD PRESSURE
- FATIGUE, SWEATING
- DIZZINESS/HEADACHE/CONFUSION
- BACK PAIN
- DIARRHEA /VOMITING
- LOW SODIUM, HIGH POTASSIUM

Healthline.com | <https://www.healthline.com/health/adrenal-crisis> | <https://www.medicinenet.com/ency/article/000357.htm>

### PARALYMPIC RECORD HOLDER

Javelin, discus and shotput U.S. record holder in his category.

Sam was one of 250 asked to attend the Paralympic Trials for the London Paralympics. He received a bronze medal in javelin.



### YOUTUBE: MIRACLEBOY SAM

- Sam acts as a speaker for:
  - The Think First Program
  - Michigan Pediatric Trauma Conference
  - Special Olympics Kick-Off Convention
  - School Programs in Saginaw, Lansing, Midland, Bay City, Escaroba to mention a few
- Disability Sensitivity Program
- Delta College Graduate - Associate of Science
  - (see a separate slide in this discussion)
  - Service and Leadership Award
  - Life Science Award
- Oakland University, Human Medicine with a integrative holistic medicine concentration.



### Pituitary Changes During Illness vs TBI

May be normal for pituitary function to decrease during severe illness.

- Decrease GH
- Temporary

#### Pituitary changes after TBI

- Low cortisol will affect BP thus circulation to the brain and may increase the damage
- Cortisol replacement improves outcomes if temporary adrenal insufficiency exists
- PF may be partial or complete failure (Sam)
- Acute or occurring months to years later.

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## RESEARCH, QUESTIONS, CONTROVERSY

As you may have realized, there is controversy about pituitary failure following TBI.

- And there are many questions
- How does a normal pituitary respond after a TBI even when it is not damaged?
  - When is medical intervention required?
  - How often or long should assessments occur?

Controversy is Positive:

- Bob Woodruff September 2007
- Increasing worldwide research
- Reevaluating prior research methods
- Improving testing for Pituitary failure
- Suggestions for identification and evaluation of patients

## Inclusion Guidelines

### Inclusion criteria

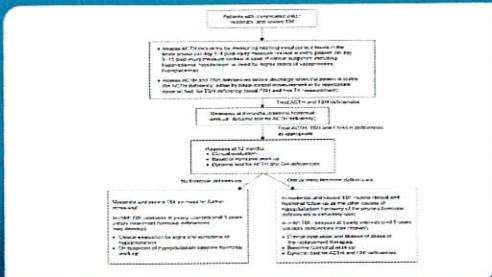
- Those patients regardless of the severity of TBI who need hospitalization for at least 24 hours and who need ICU monitoring in particular, should be screened during the acute phase and prospectively.
- Those with a history of complicated mild TBI, moderate TBI, or severe TBI at any time after the event (especially those who have suspicious signs and symptoms of hypopituitarism). Complicated mild TBI is defined by the presence of at least one of the following conditions:
  - Need for hospitalization for more than 24 hours
  - Need for ICU monitoring and/or need for any neurosurgical intervention
  - Presence of acute pituitary hormone changes during the first 2 weeks after TBI (ACTH deficiency and/or central DI)
  - Any anatomical changes on initial CT or MRI

### Exclusion criteria

- Mild TBI patients who are discharged from emergency units and/or who have no loss of consciousness and/or post-traumatic amnesia of less than 30 minutes
- TBI patients in a chronic vegetative state with low life expectancy

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## Treatment Flowchart



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Because of our experience, I am a firm believer pituitary testing after moderate/severe TBI. And then retesting yearly and then testing when there is a significant health changes.

The dilemma in recognizing pituitary dysfunction comes with partial failure or low endocrine hormones. Post TBI and Pituitary failure symptoms can be very similar. Memory, cognition, drive, energy, and mood can be a result of TBI or PF. If it is PF, it is treatable condition. We do need uniform testing for reliable results to identification and guide treatment of pituitary failure.

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## HE'S BAAAACK.

Sam suffers speech issues, impulsivity, logorrhea (extreme talkativeness), imbalance, nystagmus and right eye blindness. But, under it all, he is still the Sam we knew.

His pituitary failure is lifelong and with careful management, he can live a full life. We are so thankful his pituitary failure was recognized so he did not become one of those statistics.



## Introducing my son, Sam

Are there any questions for Dr. Jaffe or Maureen ?

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