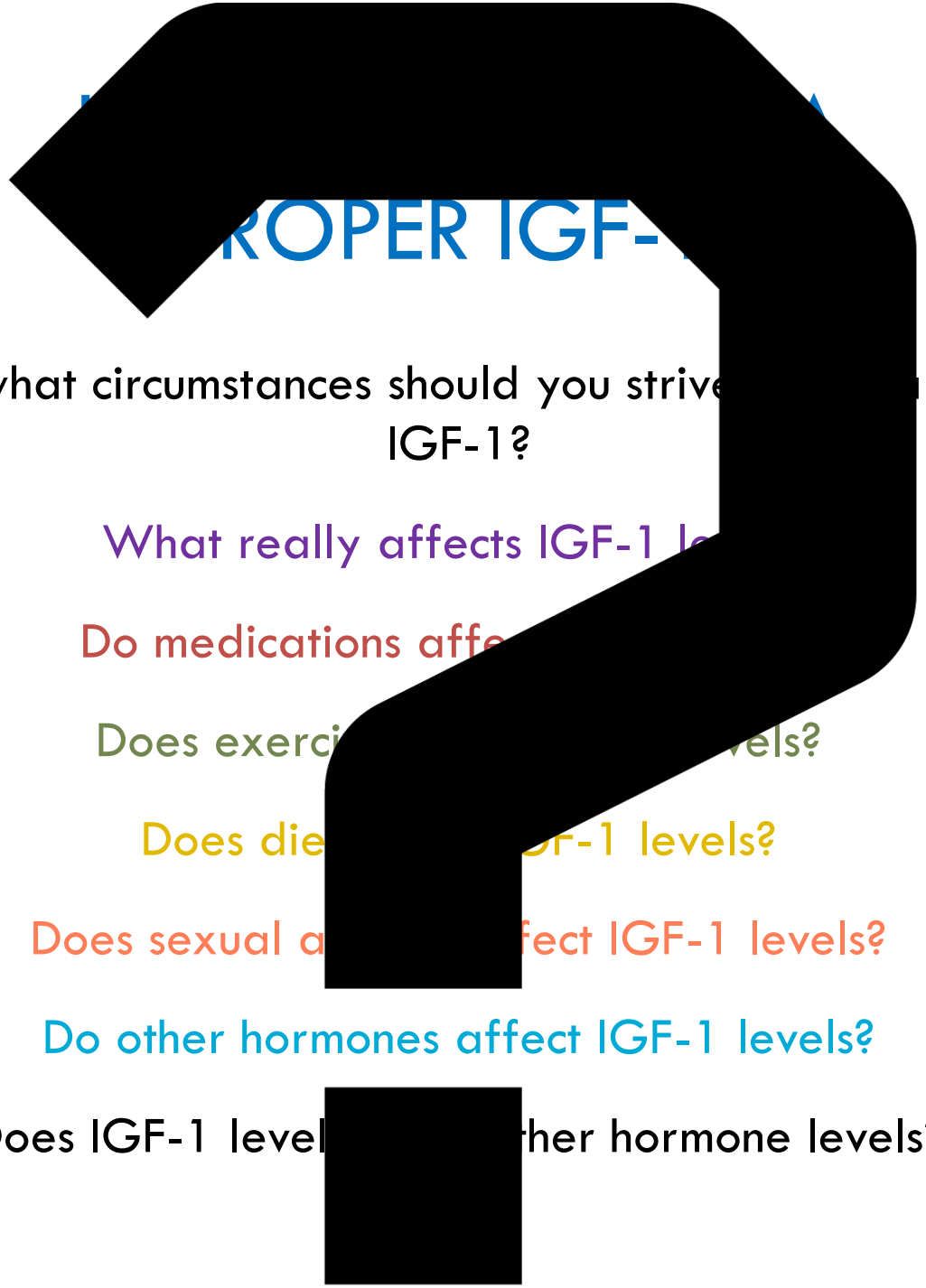
Obtaining Proper Growth Hormone Lab Levels

And New Safety Information Regarding HGH – What HGH Research Has Taught Us…

BY DAN PURSER, MD

POSSIBLE TEST QUESTIONS TODAY



ROPER IGF-

Under what circumstances should you strive proper IGF-1?

What really affects IGF-1 l

Do medications affe

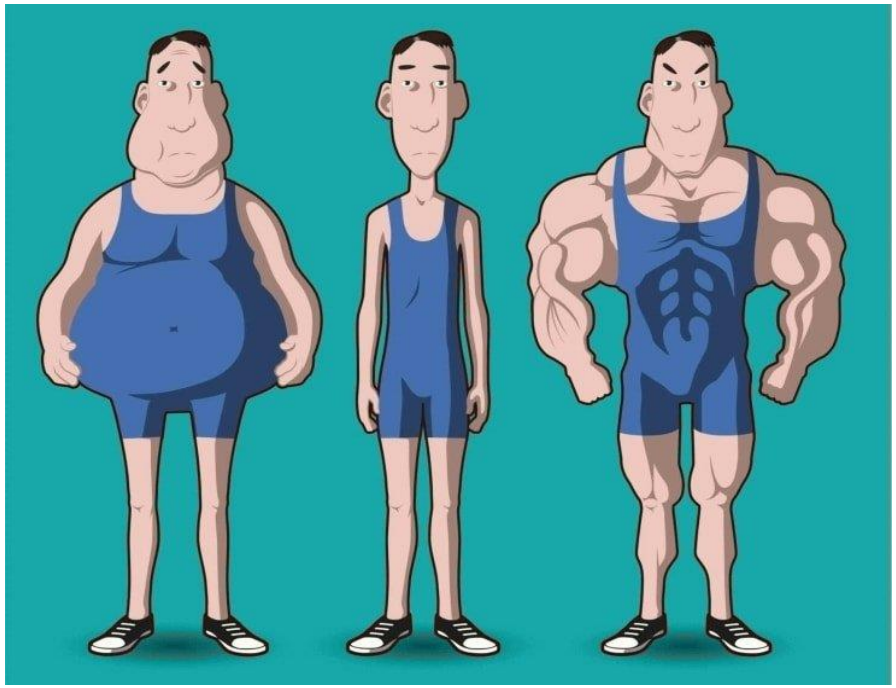
Does exerci vels?

Does die F-1 levels?

Does sexual a fect IGF-1 levels?

Do other hormones affect IGF-1 levels?

Does IGF-1 level her hormone levels?



What is HGH?

Huge complex molecule.

Critical to sleep and body being able to heal.

Critical to mental well being too – maybe the most critical thing.

Something rarely, if ever, covered by insurance.

(Treats PTSD)

Is HGH safe to give?

J Clin Endocrinol Metab. 2013 Mar;98(3):980-8. doi: 10.1210/jc.2012-2684. Epub 2013 Jan 23.

Prospective safety surveillance of GH-deficient adults: comparison of GH-treated vs untreated patients.

Hartman ML[1], Xu R, Crowe BJ, Robison LL, Erfurth EM, Kleinberg DL, Zimmermann AG, Woodmansee WW, Cutler GB Jr, Chipman JJ, Melmed S; International HypoCCS Advisory Board.

⊕ **Collaborators (173)**

⊖ **Author information**

[1]Lilly Research Laboratories, Indianapolis, Indiana 46285, USA.

Abstract

CONTEXT: In clinical practice, the safety profile of GH replacement therapy for GH-deficient adults compared with no replacement therapy is unknown.

OBJECTIVE: The objective of this study was to compare adverse events (AEs) in GH-deficient adults who were GH-treated with those in GH-deficient adults who did not receive GH replacement.

DESIGN AND SETTING: This was a prospective observational study in the setting of US clinical practices.

PATIENTS AND OUTCOME MEASURES: AEs were compared between GH-treated (n = 1988) and untreated (n = 442) GH-deficient adults after adjusting for baseline group differences and controlling the false discovery rate. The standardized mortality ratio was calculated using US mortality rates.

RESULTS: After a mean follow-up of 2.3 years, there was no significant difference in rates of death, cancer, intracranial tumor growth or recurrence, diabetes, or cardiovascular events in GH-treated compared with untreated patients. The standardized mortality ratio was not increased in either group. Unexpected AEs (GH-treated vs untreated, $P \leq .05$) included insomnia (6.4% vs 2.7%), dyspnea (4.2% vs 2.0%), anxiety (3.4% vs 0.9%), sleep apnea (3.3% vs 0.9%), and decreased libido (2.1% vs 0.2%). Some of these AEs were related to baseline risk factors (including obesity and cardiopulmonary disease), higher GH dose, or concomitant GH side effects.

CONCLUSIONS: In GH-deficient adults, there was no evidence for a GH treatment effect on death, cancer, intracranial tumor recurrence, diabetes, or cardiovascular events, although the follow-up period was of insufficient duration to be conclusive for these long-term events. The identification of unexpected GH-related AEs reinforces the fact that patient selection and GH dose titration are important to ensure safety of adult GH replacement.

PMID: 23345098 [PubMed - indexed for MEDLINE] PMCID: PMC3677286 **Free PMC Article**

What does HGH do in an adult?

It is the healing hormone first and foremost.

Helps with sleep and somnolence – causes REM sleep.

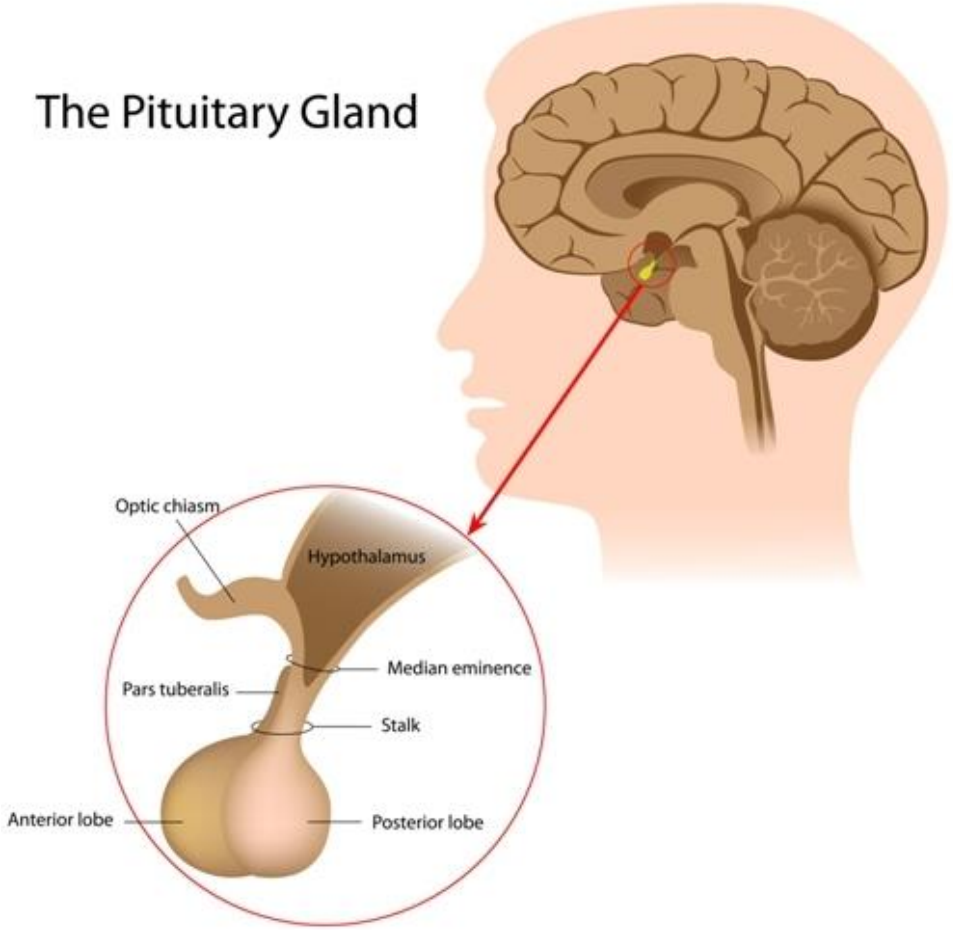
Helps clear brain fog.

Helps with fatigue.

Improves immune system functionality.

Gives mental stability – prevents PTSD.

Where is HGH created?



In the upper portion of the anterior pituitary (front of the pituitary).

This area is most likely to be injured with a TBI.

Catches on the edge of the sella turcica.

LOC event? 100% chance of pituitary damage…

How is HGH released?

Upon signal from the hypothalamus.

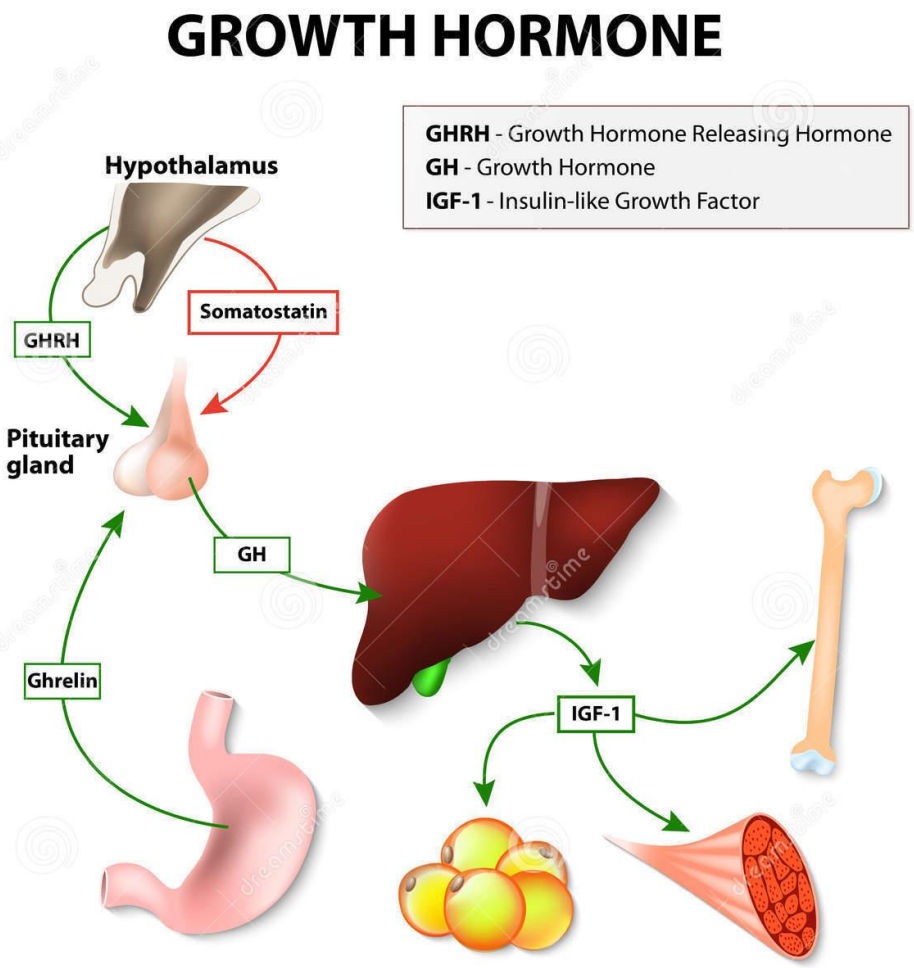
L-arginine causes a big release.

Lowered blood sugar causes release (ITT).

Stress causes a release.

Exercise causes a release.

How does HGH react once released?



Breaks up into 23 other hormones.

This occurs in milliseconds.

Almost all of these, except one, are very short-lived.

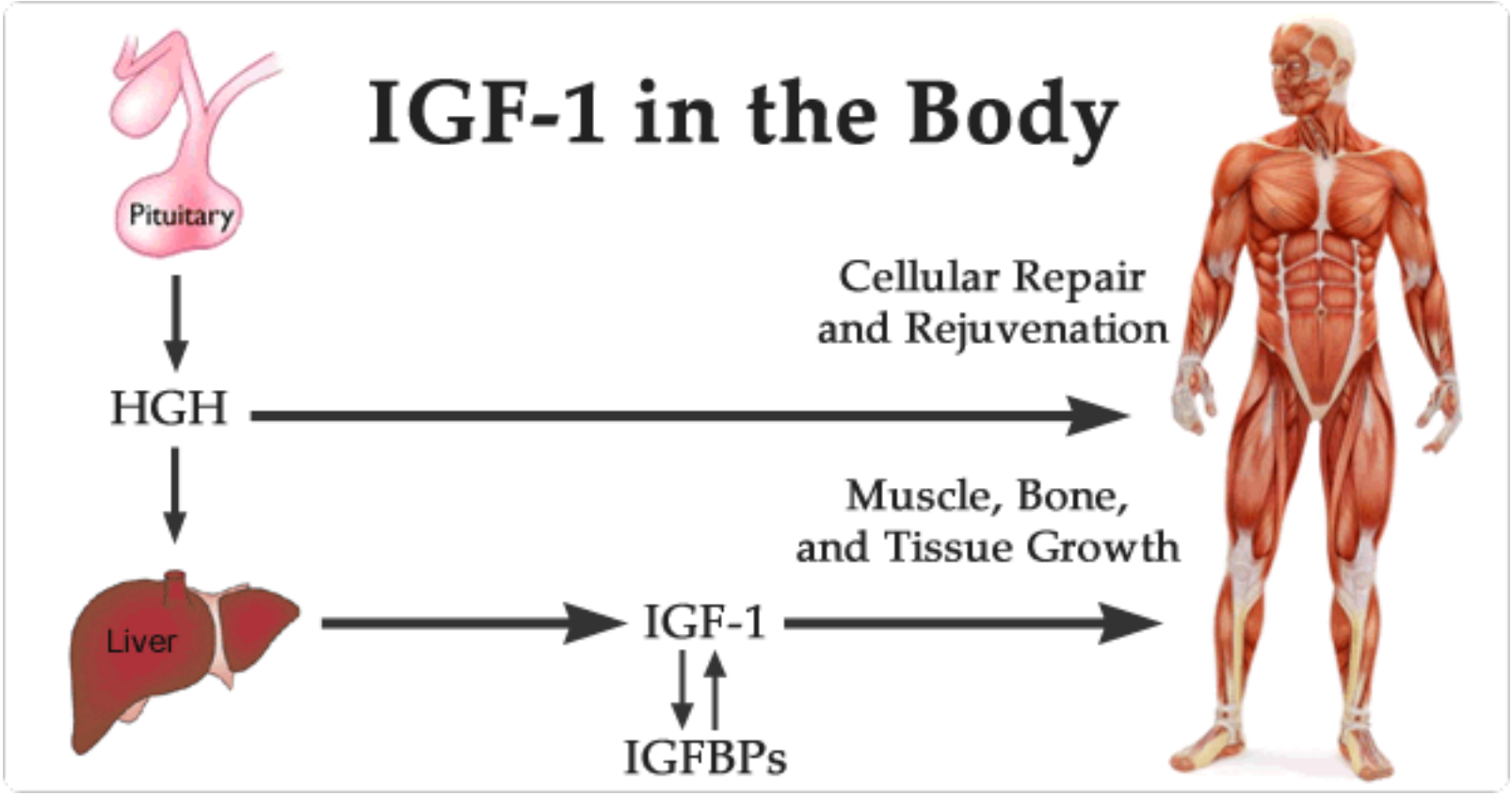
The only one that hangs around for any amount of time is the IGF-1.

So we check IGF-1.

IGF-1 ACTS AS A PROXY MEASUREMENT OF HGH

Sub-hormones released from HGH when it is broken up?

IGF-1 & IGF-BP3



How do you obtain "proper" HGH levels?

Hard to do.

Must prepare the patient (water fast).

Must have the right tubes.

[GREEN TUBE FROZEN ON DRY ICE]

Potentially very inaccurate.

So instead we get an IGF-1 as the proxy.

(No one has the time to perform properly.)

Things that FALSELY elevate IGF-1 level?

Exercise (intercourse IS exercise)

Certain medications

Food (so should be fasting – water is okay)

Grhelin – within food (beans, nuts, etc)

Medications that FALSELY elevate IGF-1 levels?

Provigil®

Nuvigil®

Effexor®

Zoloft®

Cymbalta®

Lyrica®

Hold for 24 hours IF possible or safe before drawing Fasting AM IGF-1.

In research we often held for 3 days to three weeks (usually a bad idea).

Foods that FALSELY elevate IGF-1 levels?

All foods will so they should **"water fast 24-72 hours"** before the blood draw (alright to drink pure water but nothing else).

Nuts (contain grhelin). NO PEANUT BUTTER!

Any protein that contains l-arginine (which is most).

Fast for at least 24 hours IF possible or safe before drawing a morning IGF-1. We often ask for 72 hours if in doubt.

Coffee is okay (no cream or sugar).

A “PROPERLY” obtained IGF-1

No stress the few days before.

No sex the day or night before.

“(Just) Water fasting” for up to 72 hours.

No STIMULATING MEDS for 3 days to 3 weeks (see list).

No exercise the day or night before.

Drawn in AM.

Is this IGF-1 worth it?

Yes.

Can tell you a lot about your patient.

Can allow you to properly make the diagnosis of AGHD (Adult Growth Hormone Deficiency).

Or diagnose a HGH-eluting pituitary tumor.

Or malnutrution such as vitamin deficiencies.

What is STIM testing?

A physician's attempt to stimulate the pituitary to elute HGH.

Usually an ITT or Arginine Stim test.

Insulin Tolerance Testing (ITT) can be brutal.

500mg of oral Arginine does not work very well – but remains an option.

INSULIN TOLERANCE TESTING

(Is 99% of the time an insurance construct/hurdle/requirement and NOT a diagnostic requirement.)

If done the insurance companies then often require it to be repeated annually.

“HA ha ha ha ha ha ha” (Insurance company benefits manager)

The game is HORRIBLE!!!

What is ITT?

Insulin Tolerance Test.

Insurance companies prefer this.

No reimbursement to doctor for doing this 5 hour dangerous test.

(NO REIMBURSMENT!!!)

Fasting patient – give 10u regular insulin IV to drop BS <40 for 4hrs.

Then draws HGH levels every 1/2 hour.

ITT is brutal & dangerous (seizure or MI or both).

MAJOR KICKER? Few endocrinologists know how to perform but they won't admit it.

How and why does one need stimulation testing?

Insurance, in order to reimburse for HGH, throws it up as an impossible hurdle but demands it anyway.

HGH will rarely be reimbursed for many seasons despite positive ITT.

Constant fight.

You can never make them happy (which is what they intend).

SO INSTEAD, WE GET AN IGF-1!

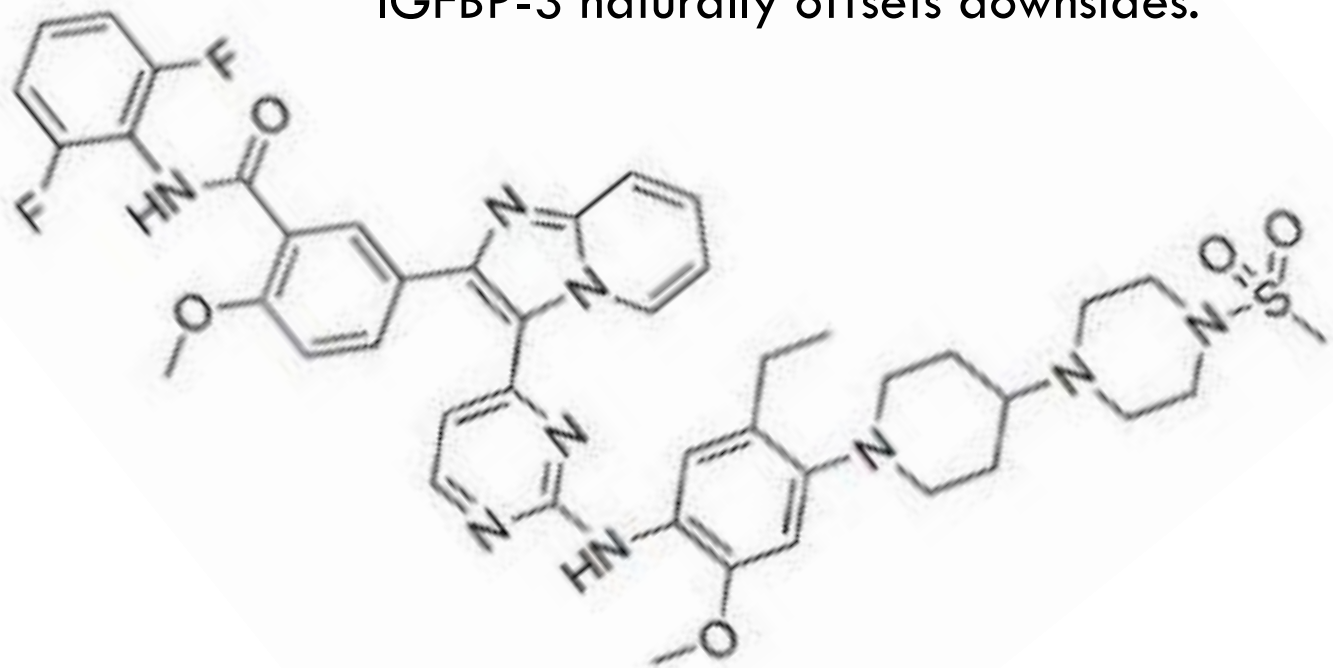
(AND TELL THE PATIENT TO FORGET INSURANCE COVERING IT – NOT GOING TO HAPPEN – SO EXPECT TO PAY CASH.)

What is an IGF-1?

The subhormone of HGH that hangs around the longest after the breaking apart of the super large HGH

IGF-1 benefits many but downsides too.

IGFBP-3 naturally offsets downsides.



What is considered to be a HIGH IGF-1?

IGF-1 varies according to age.

Teenagers can and should have very HIGH IGF-1 so do not be shocked – the taller the teenager the higher the IGF-1.

A properly obtained IGF-1 above 300 ng/mL is usually high for an older adult.

Above 650 ng/mL for a teenager.

Must have symptoms of high HGH (early acromegaly symptoms) – muscle and joint aches are the earliest.

Symptoms of too much HGH for too long…

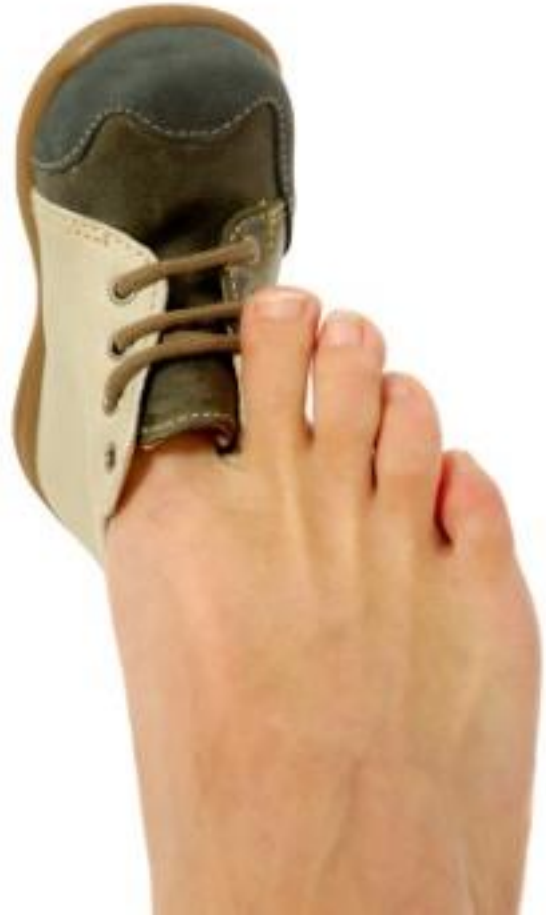
Rings won't fit (too small).

Shoes won't fit (too small).

Overall muscle and bone aches.

Frontal brow bossing (bad).

Frontal jaw enlargement (bad).



Can you diagnose a growth hormone producing tumor off of a high IGF-1?

If properly obtained it should make you worry.

Remember to ask what meds they were on etc.

Repeat under "perfect" circumstances to confirm.

Get prolactin level next too.

Any recent history of trauma?

Get 3T MRI with contrast! (Why?)

Then neurosurgery consult.

Even then it might not show on MRI.

A nice IGF-1 range card

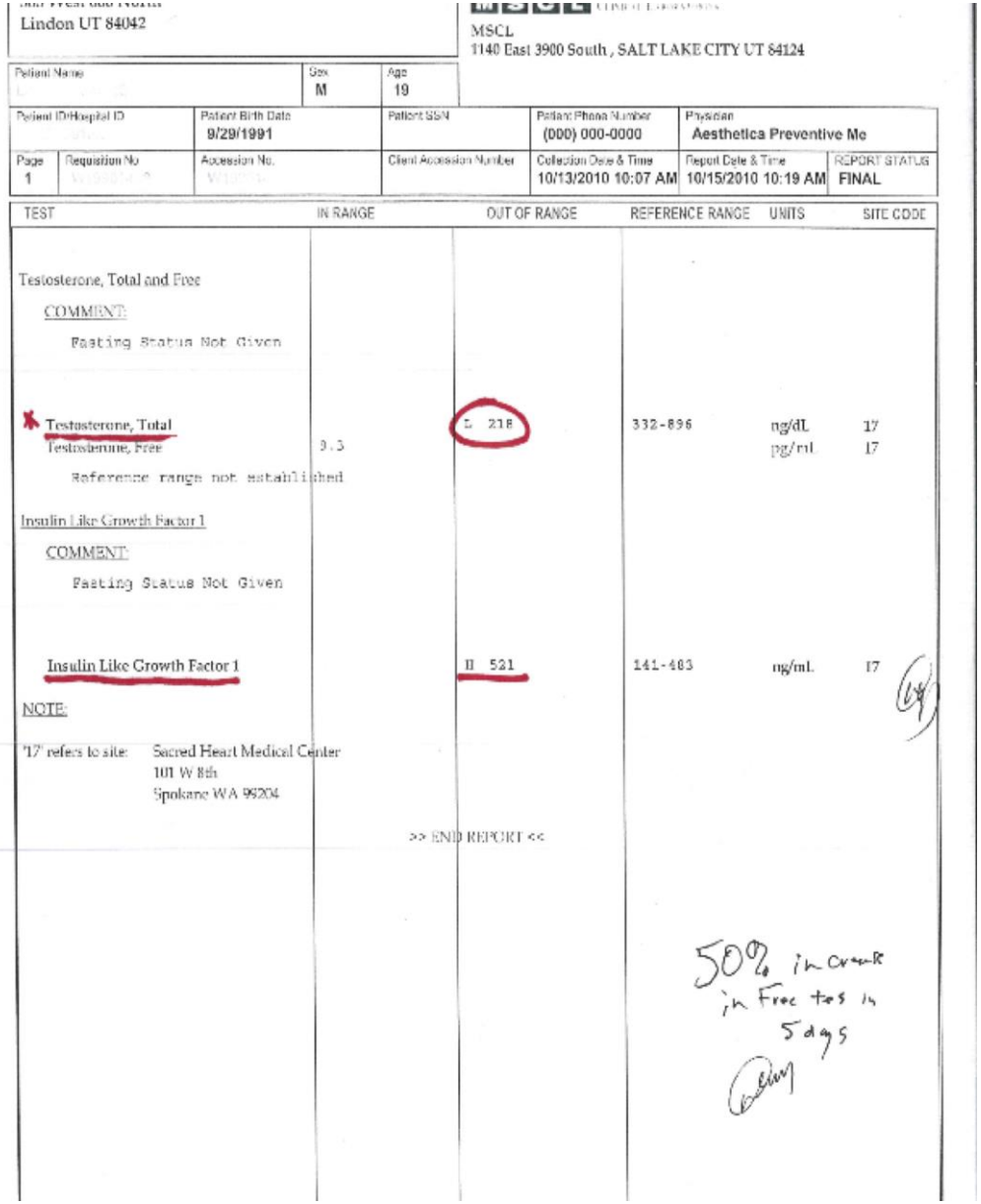
Table 2. Mean, median, lower (2.5th percentile, mean - 2 SD) and upper (97.5th percentile and mean + 2 SD) limit of IGF-1 (µg/L) according to age group

Age group	2.5th percentile	Mean - 2 SD*	Mean	Median	97.5th percentile	Mean + 2 SD*
21-25 years	111	110	195	197	334	336
26-30 years	109	108	187	190	310	312
31-35 years	106	106	178	178	287	290
36-40 years	102	100	168	169	265	267
41-45 years	95	95	165	163	250	253
46-50 years	87	86	145	145	240	243
51-55 years	81	80	137	137	220	222
56-60 years	75	75	129	127	207	210
61-65 years	68	68	120	121	197	201
66-70 years	65	65	110	110	185	188

* Of log-transformed values converted to the corresponding original value.

LAB EXAMPLE

25m



Lindon UT 84042

MSCL
1140 East 3900 South , SALT LAKE CITY UT 84124

Patient Name	Sex	Age
	M	19

Patient ID/Hospital ID	Patient Birth Date	Patient SSN	Patient Phone Number	Physician
	9/29/1991		(000) 000-0000	Aesthetica Preventive Me

Page	Requisition No	Accession No.	Client Accession Number	Collection Date & Time	Report Date & Time	REPORT STATUS
1				10/13/2010 10:07 AM	10/15/2010 10:19 AM	FINAL

TEST	IN RANGE	OUT OF RANGE	REFERENCE RANGE	UNITS	SITE CODE
Testosterone, Total and Free					
COMMENT: Fasting Status Not Given					
* Testosterone, Total		L 218	332-896	ng/dL	17
Testosterone, Free	9.3			pg/ml	17
Reference range not established					
Insulin Like Growth Factor 1					
COMMENT: Fasting Status Not Given					
Insulin Like Growth Factor 1		H 521	141-483	ng/mL	17

NOTE:

'17' refers to site: Sacred Heart Medical Center
101 W 8th
Spokane WA 99204

>> END REPORT <<

50% increase in Free tes in 5 days

High IGF-1 in an 18 year old male.

Why is it so high?

Why is his testosterone so low?

Was this properly obtained?

Does his age matter?

He was not fasting – is that important?

Maybe he was on an anti-depressant – does that matter?

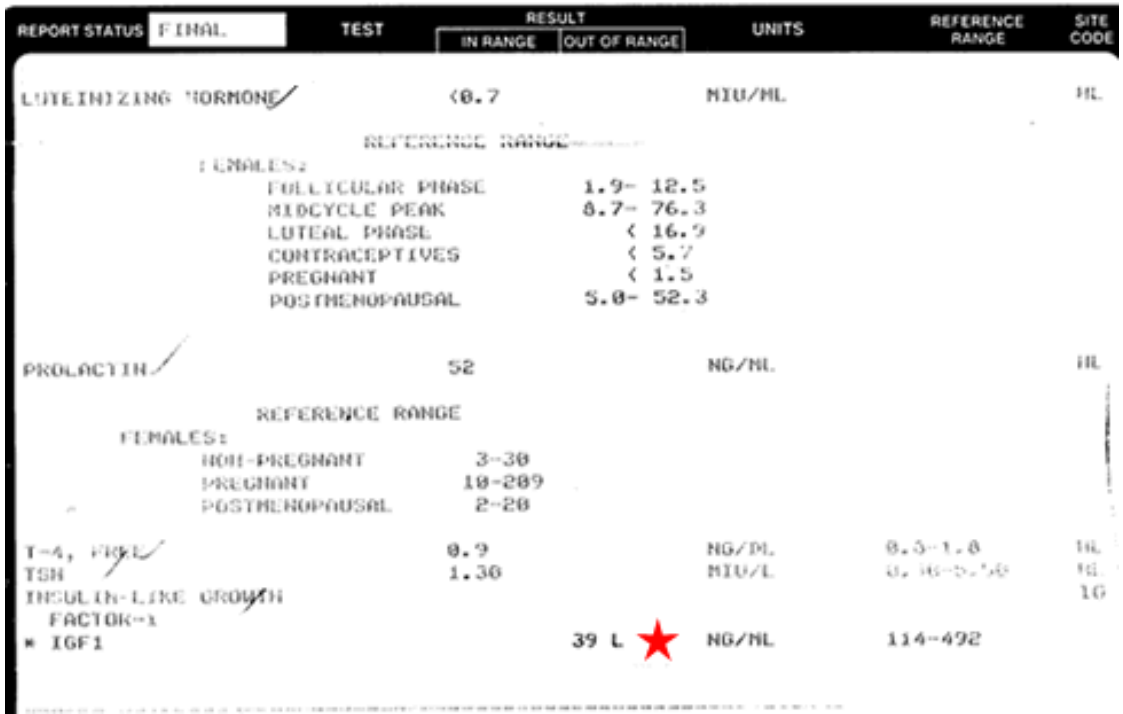
What is a LOW IGF-1?

This depends on age primarily.

Young teenagers, or young adults should be very high usually. –300-600+ng/mL

If below 100ng/mL, properly staged & drawn, and they have symptoms then strongly positive for AGHD.

(Remember get a PROLACTIN level to make sure no prolactinoma. Prolactin can be exuded after trauma too.)



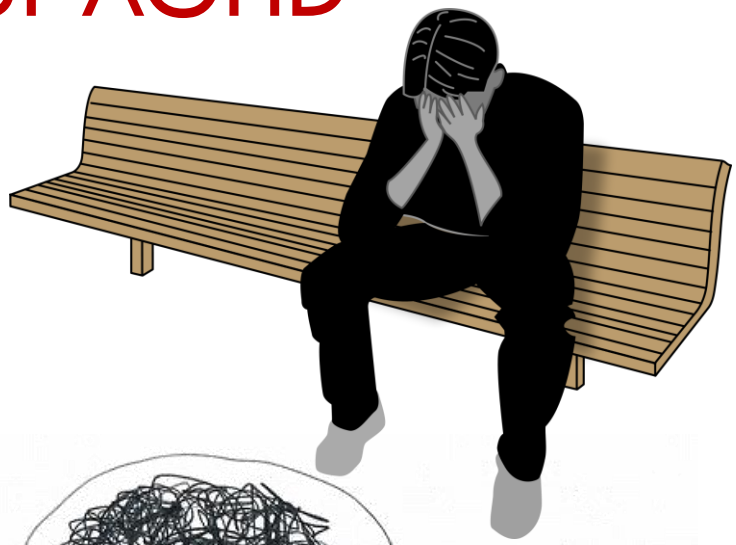
REPORT STATUS FINAL	TEST	RESULT IN RANGE	RESULT OUT OF RANGE	UNITS	REFERENCE RANGE	SITE CODE
LUTEINIZING HORMONE		<0.7		MIU/ML		HL
	REFERENCE RANGE					
	FEMALES:					
	FOLLICULAR PHASE	1.9- 12.5				
	MIDCYCLE PEAK	8.7- 76.3				
	LUTEAL PHASE	< 16.9				
	CONTRACEPTIVES	< 5.7				
	PREGNANT	< 1.5				
	POSTMENOPAUSAL	5.0- 52.3				
PROLACTIN		52		NG/ML		HL
	REFERENCE RANGE					
	FEMALES:					
	NON-PREGNANT	3-30				
	PREGNANT	10-209				
	POSTMENOPAUSAL	2-20				
T-4, FREE		0.9		NG/DL	0.5-1.8	HL
TSH		1.30		MIU/L	0.46-5.46	HL
INSULIN-LIKE GROWTH FACTOR-1						LG
* IGF1			39 L ★	NG/ML	114-492	

Can you diagnose a Adult Growth Hormone Deficiency based on a low IGF-1?

If properly obtained.

And has symptoms of AGHD.

Symptoms of AGHD



Fatigue

Brain fog

Moderate to BEYOND SEVERE Insomnia

PTSD

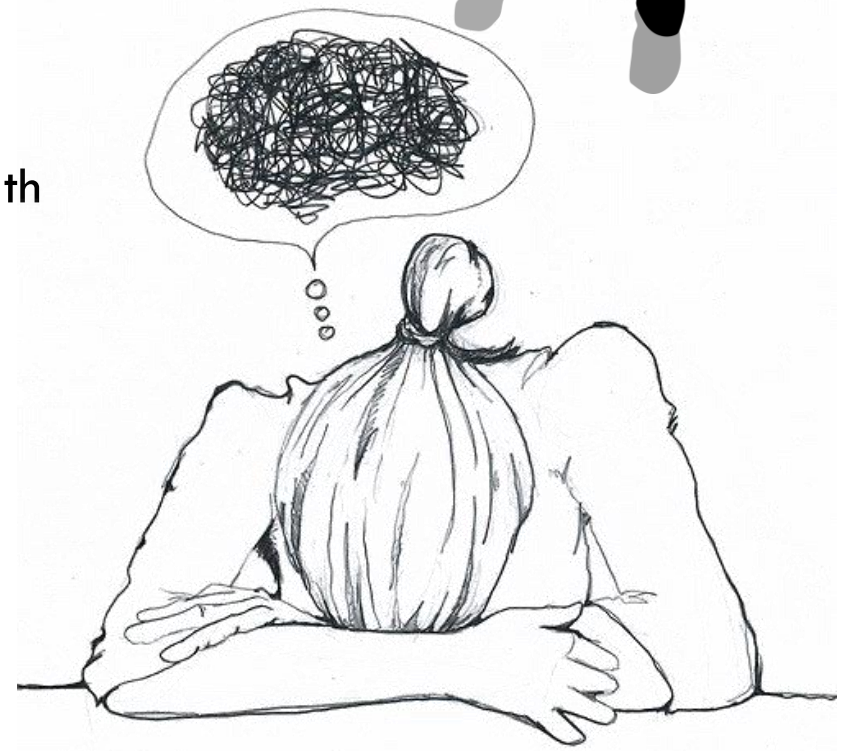
Feelings of impending doom or death

Feelings of hopelessness

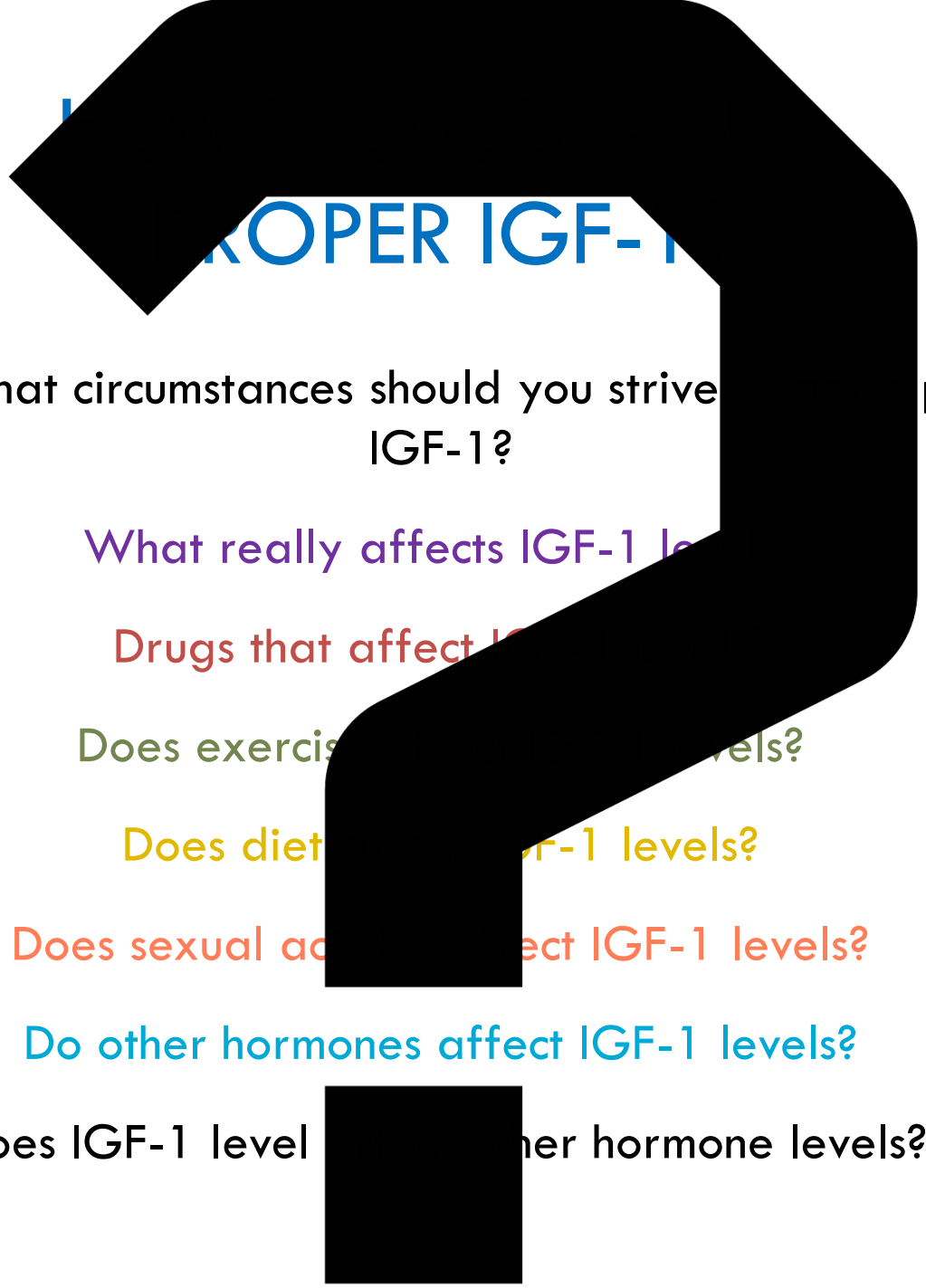
Say their legs feel like cement.

These are usually bad symptoms

Short stature (< 5'0")



POSSIBLE TEST QUESTIONS TODAY



ROPER IGF-1

Under what circumstances should you strive proper IGF-1?

What really affects IGF-1 le

Drugs that affect I

Does exercis vels?

Does diet F-1 levels?

Does sexual ac ect IGF-1 levels?

Do other hormones affect IGF-1 levels?

Does IGF-1 level her hormone levels?

Under what circumstances should you strive to get a proper IGF-1?

Someone with severe insomnia and fatigue.

S/P a significant TBI.

S/P a LOC event.

Someone who cannot heal properly.

Someone who hurts all over (similar to fibromyalgia).

Does HGH (i.e. IGF-1 levels) affect other hormone levels? Or vice versa?

Low IGF-1 could give a falsely low value to testosterone levels (male or female).

A low testosterone level will do the same to IGF-1.

They tend to act copasetically or in tandem (usually but not always).

↓ IGF-1

↓ Total Testosterone

Can trauma affect IGF-1 levels?

YES but of course it varies.

Big surge directly afterwards from a freshly or recently damaged pituitary (TBI or LOC event) [SO DON'T BE FOOLED].

After weeks or months the level could drop to below 100 ng/mL or lower (11?).

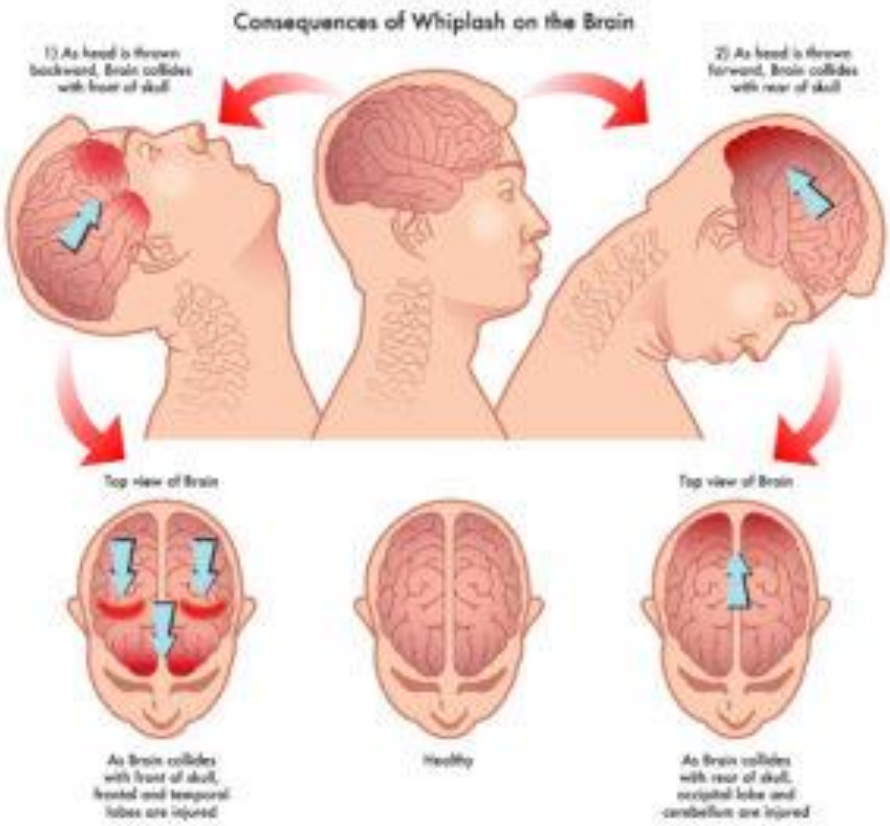
Gets lower or worse over time.

Can take a year or two or three (YES 3!!!) in younger people so watch them closely.

In the NFL Player's Association Brain Trauma Study…

- NO ONE we looked at had an intact pituitary.
- Not one.
- Not even a kicker.

Can TBI affect IGF-1 levels?



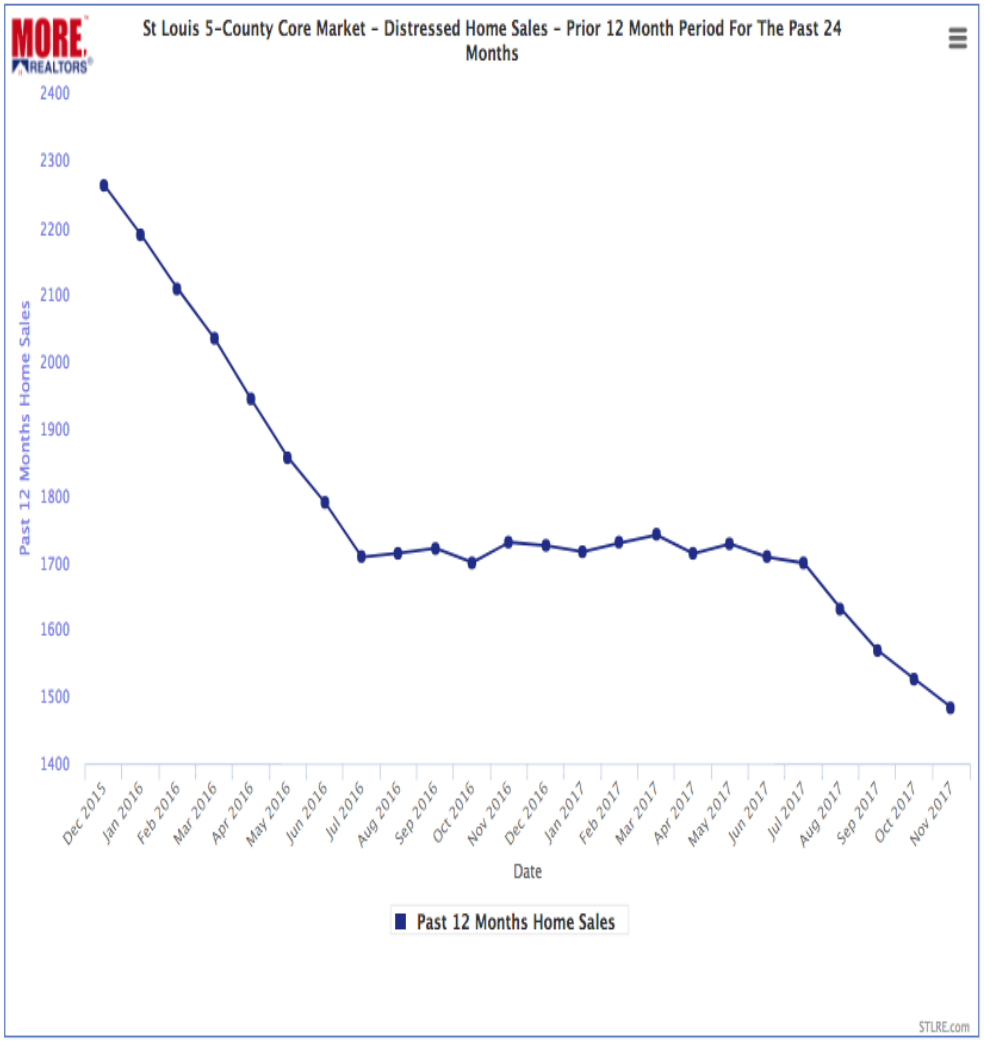
Yes, but not always.

Get an IGF-1 as soon as the trauma has occurred.

Follow longitudinally for at least 6 months to 3 years.

LOC event guarantees *at least some* anterior pituitary dysfunction.

TBI causing pituitary dysfunction in a younger athlete – **takes a while.**



Their levels are so high it can take years.

Warn the parents and coaches.

Watch over them.

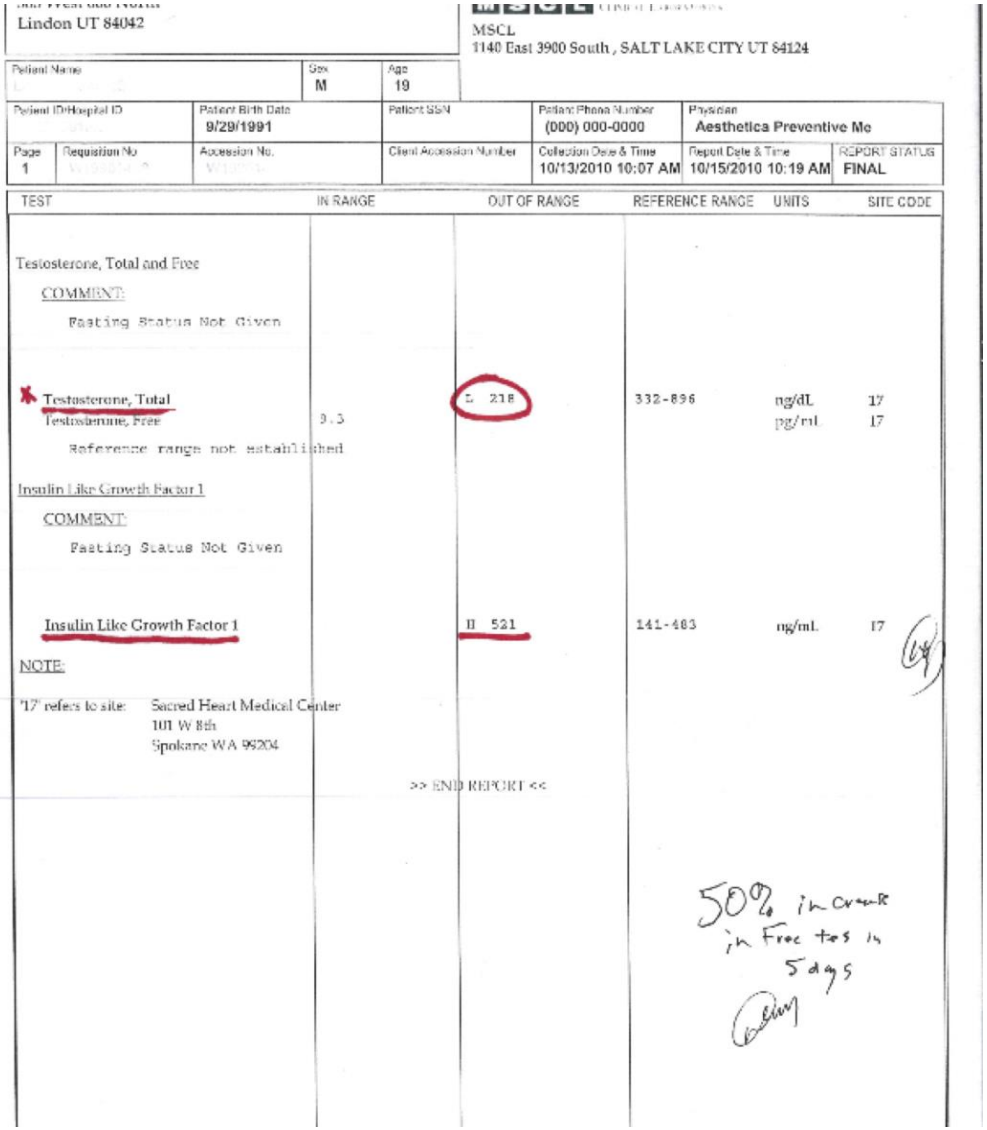
Get a "baseline" IGF-1 as soon after the trauma as you can.

If possible, keep using the same lab.

PATIENT EXAMPLES

PATIENT #1

A young guy with low tes and high HGH – WHY?



Lindon UT 84042

MSCL
1140 East 3900 South , SALT LAKE CITY UT 84124

Patient Name	Sex	Age
	M	19

Patient ID/Hospital ID	Patient Birth Date	Patient SSN	Patient Phone Number	Physician
	9/29/1991		(000) 000-0000	Aesthetica Preventive Me

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101 W 8th
Spokane WA 99204

>> END REPORT <<

50% increase in Free tes in 5 days

A young guy with low tes and high HGH – WHY?

SpectraCell Laboratories
Science + Health + Solutions

LABORATORY REPORT

Account Number:

Danny Purser , M.D.
383 W. 600 North
Lindon, UT 84042
USA

Name:
Gender:
DOB: 09/29/1991

Accession Number:
Requisition Number:

Date of Collection: 06/15/2015
Date Received: 06/16/2015
Date Reported: 06/25/2015

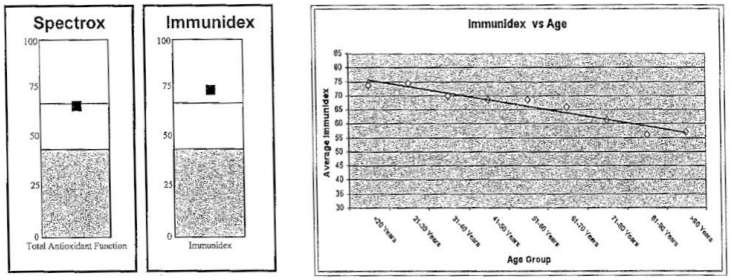
Summary of Deficient Test Results

Testing determined the following functional deficiencies:

Vitamin B12

Borderline deficiencies include:

Pantothenate Choline Chromium Zinc
Copper



John F. Crawford, Ph.D.
Laboratory Director

CLIA# 45D0710715

All tests performed by SpectraCell Laboratories, Inc. * 10401 Town Park Drive Houston, TX 77072
Tel (713) 621-3101 * Toll-free (800)-227-LABS(5227) * Fax (713) 621-3234 * www.spectracell.com

SpectraCell Laboratories
Science + Health + Solutions
10401 Town Park Drive
Houston, TX 77072

Phone: (713)621-3101
TollFree: (800)227-LABS(5227)
Fax: (281)568-5246

Laboratory Report

Account Number:

Danny Purser , M.D.
383 W. 600 North

Lindon, UT 84042

Name:
Gender:
DOB: 9/29/1991

Accession Number:
Requisition Number:

Date Collected: June 15, 2015
Date Received: June 16, 2015
Date Reported: June 22, 2015

MTHFR Genotype Test Result

Test	Result
C677T Mutation	Homozygous
A1298C Mutation	Negative

This sample has two copies of the C677T mutation and is negative for the A1298C mutation.
This genotype

- is associated with decreased enzyme activity (approximately 30% of normal activity).
- is associated with increased homocysteine levels.
- is correlated with increased risk of cardiovascular disease or thrombosis.
- is associated with potential methotrexate intolerance and patients may require dosage adjustments or discontinuation.

John F. Crawford, Ph.D.
Laboratory Director

CLIA# 45D0710715

MTHFR Background Information

MTHFR (methylenetetrahydrofolate reductase) is an enzyme involved in the metabolism of folate and homocysteine. It plays a role in maintaining cellular folate levels and is a cofactor needed to convert homocysteine (a potentially toxic amino acid) to methionine.

Certain common genetic point mutations have been characterized that reduce the function of the MTHFR enzyme. These are the C677T mutation (which is a change from cytosine to thymine at position 677 within the gene) and the A1298C mutation (which is a change from adenine to cytosine at position 1298 within the gene.) An MTHFR enzyme with reduced function can lead to elevated homocysteine levels, which is a known independent risk factor for development of cardiovascular disease and venous thrombosis. Reduced enzyme function can also affect folate status.

An additional area in which the function of MTHFR can have an effect is during methotrexate therapy. Methotrexate is a drug often used in treatment of certain cancers or autoimmune diseases. It is a structural analogue of folate and can interfere with folate metabolism. Defects in folate metabolism such as those potentially arising from mutations affecting MTHFR function can increase sensitivity to methotrexate and may lead to lower dosage requirements, increased side effects, or intolerance of the drug.

Testing Limitations

Only the C667T and A1298C mutations are analyzed in this assay. There may be other unknown non-genetic factors or genetic factors besides the tested mutations that can affect homocysteine levels, folate status, or drug sensitivities. Rare mutations in the primer binding sites used to detect the C677T and A1298C mutations may prevent detection. Specific dosing guidelines for methotrexate based on MTHFR genotype are not currently available.

MTHFR genotyping can provide useful information concerning risks of developing cardiovascular disease or thrombosis, or potential for increased sensitivity to methotrexate treatment. However, genotyping alone is not predictive of development of disease or complication and should not be used as the primary means of clinical diagnosis or treatment decision making. This information should be used by a physician in conjunction with additional clinical information to determine an appropriate treatment regimen.

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BUT THE ANSWER TO THE QUESTION IS?

He was 18 and almost always their HGH is at peak output at that age.

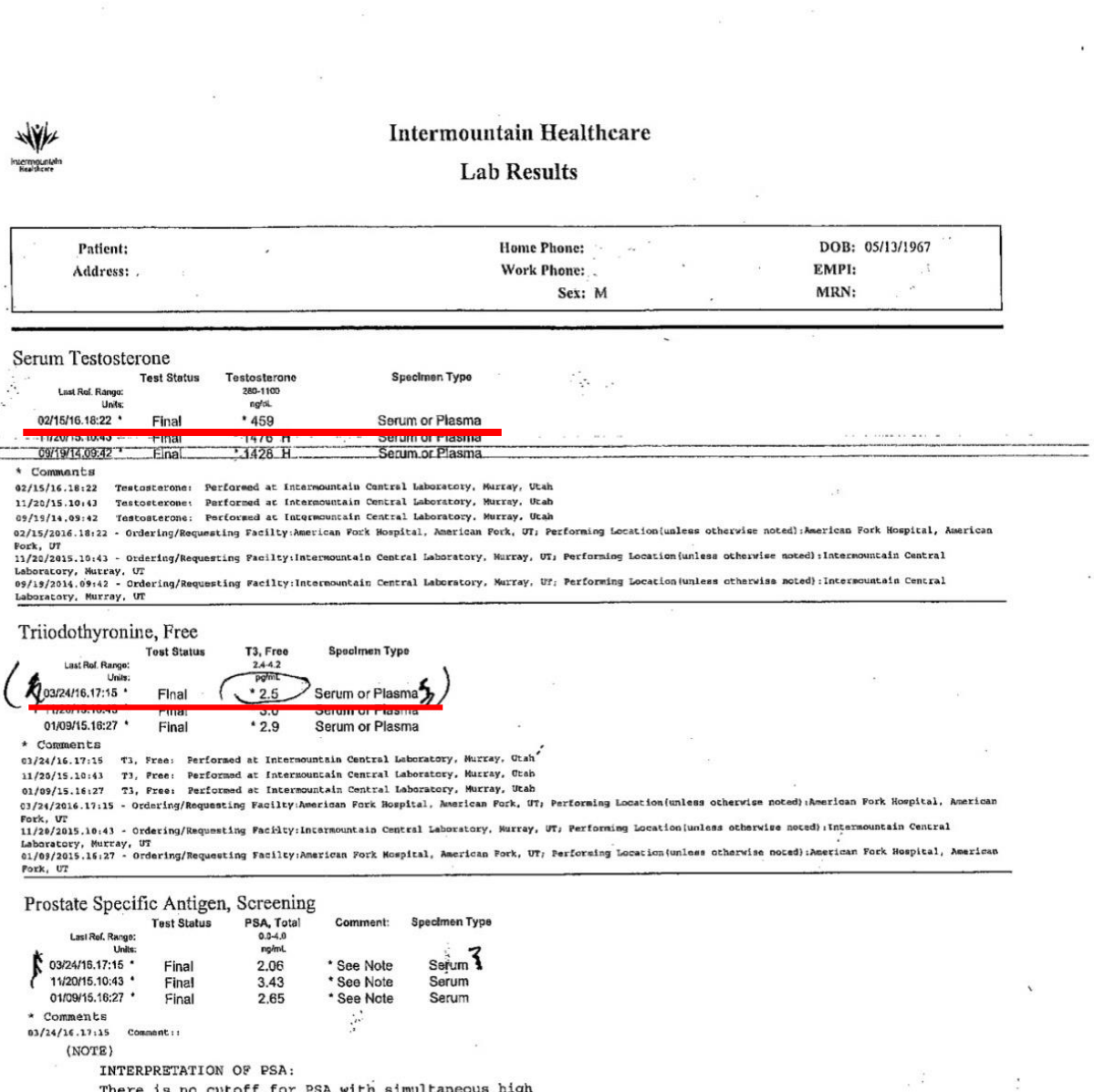
He was not fasting.

He had exercised that morning in PE.

He was on Effexor (which we stopped).

Patient #2

Remember Not all AGHD is from PITUITARY TRAUMA…



Intermountain Healthcare

Lab Results

Patient:	Home Phone:	DOB: 05/13/1967
Address:	Work Phone:	EMPI:
	Sex: M	MRN:

Serum Testosterone

Last Ref. Range: / Units:	Test Status	Testosterone 280-1100 ng/dL	Specimen Type
02/15/16.18:22 *	Final	* 459	Serum or Plasma
11/20/15.10:43 *	Final	* 1476 H	Serum or Plasma
09/19/14.09:42 *	Final	* 1426 H	Serum or Plasma

* Comments

02/15/16.18:22 Testosterone: Performed at Intermountain Central Laboratory, Murray, Utah
11/20/15.10:43 Testosterone: Performed at Intermountain Central Laboratory, Murray, Utah
09/19/14.09:42 Testosterone: Performed at Intermountain Central Laboratory, Murray, Utah
02/15/2016.18:22 - Ordering/Requesting Facilty:American Fork Hospital, American Fork, UT; Performing Location(unless otherwise noted):American Fork Hospital, American Fork, UT
11/20/2015.10:43 - Ordering/Requesting Facilty:Intermountain Central Laboratory, Murray, UT; Performing Location(unless otherwise noted):Intermountain Central Laboratory, Murray, UT
09/19/2014.09:42 - Ordering/Requesting Facilty:Intermountain Central Laboratory, Murray, UT; Performing Location(unless otherwise noted):Intermountain Central Laboratory, Murray, UT

Triiodothyronine, Free

Last Ref. Range: / Units:	Test Status	T3, Free 2.4-4.2 pg/mL	Specimen Type
03/24/16.17:15 *	Final	* 2.5	Serum or Plasma
11/20/15.10:43 *	Final	* 3.0	Serum or Plasma
01/09/15.16:27 *	Final	* 2.9	Serum or Plasma

* Comments

03/24/16.17:15 T3, Free: Performed at Intermountain Central Laboratory, Murray, Utah
11/20/15.10:43 T3, Free: Performed at Intermountain Central Laboratory, Murray, Utah
01/09/15.16:27 T3, Free: Performed at Intermountain Central Laboratory, Murray, Utah
03/24/2016.17:15 - Ordering/Requesting Facilty:American Fork Hospital, American Fork, UT; Performing Location(unless otherwise noted):American Fork Hospital, American Fork, UT
11/20/2015.10:43 - Ordering/Requesting Facilty:Intermountain Central Laboratory, Murray, UT; Performing Location(unless otherwise noted):Intermountain Central Laboratory, Murray, UT
01/09/2015.16:27 - Ordering/Requesting Facilty:American Fork Hospital, American Fork, UT; Performing Location(unless otherwise noted):American Fork Hospital, American Fork, UT

Prostate Specific Antigen, Screening

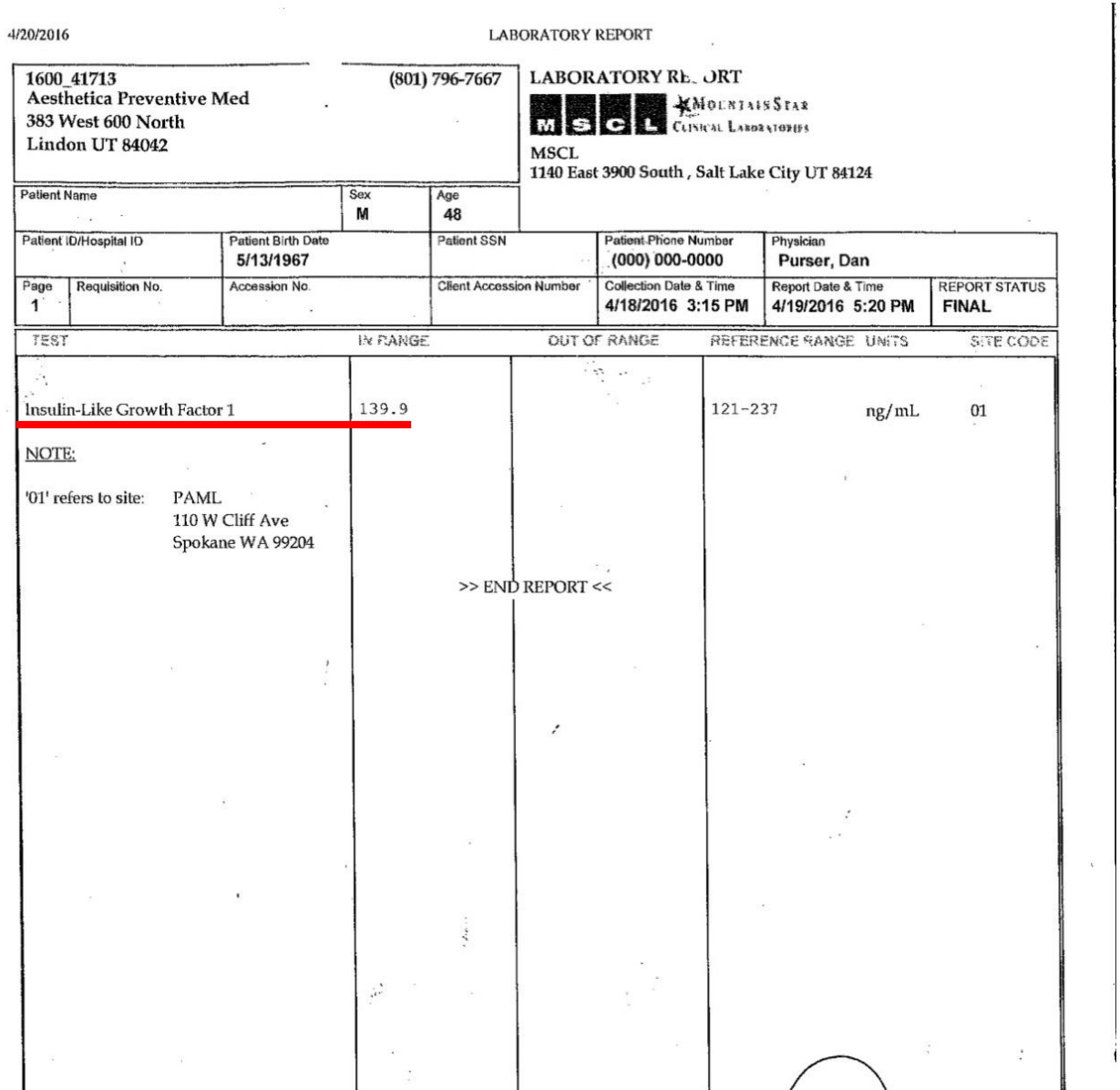
Last Ref. Range: / Units:	Test Status	PSA, Total 0.0-4.0 ng/mL	Comment:	Specimen Type
03/24/16.17:15 *	Final	2.06	* See Note	Serum
11/20/15.10:43 *	Final	3.43	* See Note	Serum
01/09/15.16:27 *	Final	2.65	* See Note	Serum

* Comments

03/24/16.17:15 Comment::
(NOTE)
INTERPRETATION OF PSA:
There is no cutoff for PSA with simultaneous high

Total Tes 459
FT3 2.5
???????

Remember Not all AGHD is from PITUITARY TRAUMA…



4/20/2016 LABORATORY REPORT

1600_41713
Aesthetica Preventive Med
383 West 600 North
Lindon UT 84042
(801) 796-7667

LABORATORY REPORT
MSCL MountainStar Clinical Laboratories
MSCL
1140 East 3900 South , Salt Lake City UT 84124

Patient Name	Sex	Age
	M	48

Patient ID/Hospital ID	Patient Birth Date	Patient SSN	Patient Phone Number	Physician
	5/13/1967		(000) 000-0000	Purser, Dan

Page	Requisition No.	Accession No.	Client Accession Number	Collection Date & Time	Report Date & Time	REPORT STATUS
1				4/18/2016 3:15 PM	4/19/2016 5:20 PM	FINAL

TEST	IN RANGE	OUT OF RANGE	REFERENCE RANGE	UNITS	SITE CODE
Insulin-Like Growth Factor 1	139.9		121-237	ng/mL	01

NOTE:

'01' refers to site: PAML
110 W Cliff Ave
Spokane WA 99204

>> END REPORT <<

Remember Not all AGHD is from PITUITARY TRAUMA…

Account Number:

Danny Purser , M.D.
383 W. 600 North
Lindon, UT 84042
USA

Name:
Gender: Male DOB: 05/13/1967

Accession Number:
Requisition Number:

Date of Collection: 04/18/2016
Date Received: 04/19/2016
Date Reported: 04/28/2016

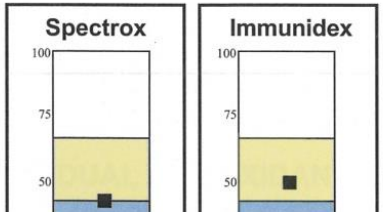
Summary of Deficient Test Results

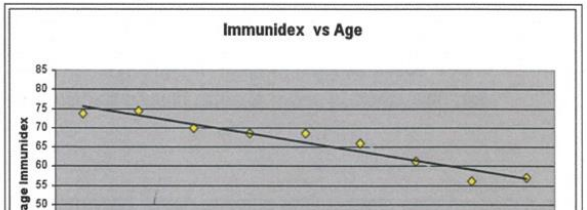
Testing determined the following functional deficiencies:

Oleic Acid	Vitamin D3	Vitamin A	Zinc
Coenzyme Q-10	Vitamin C	Copper	

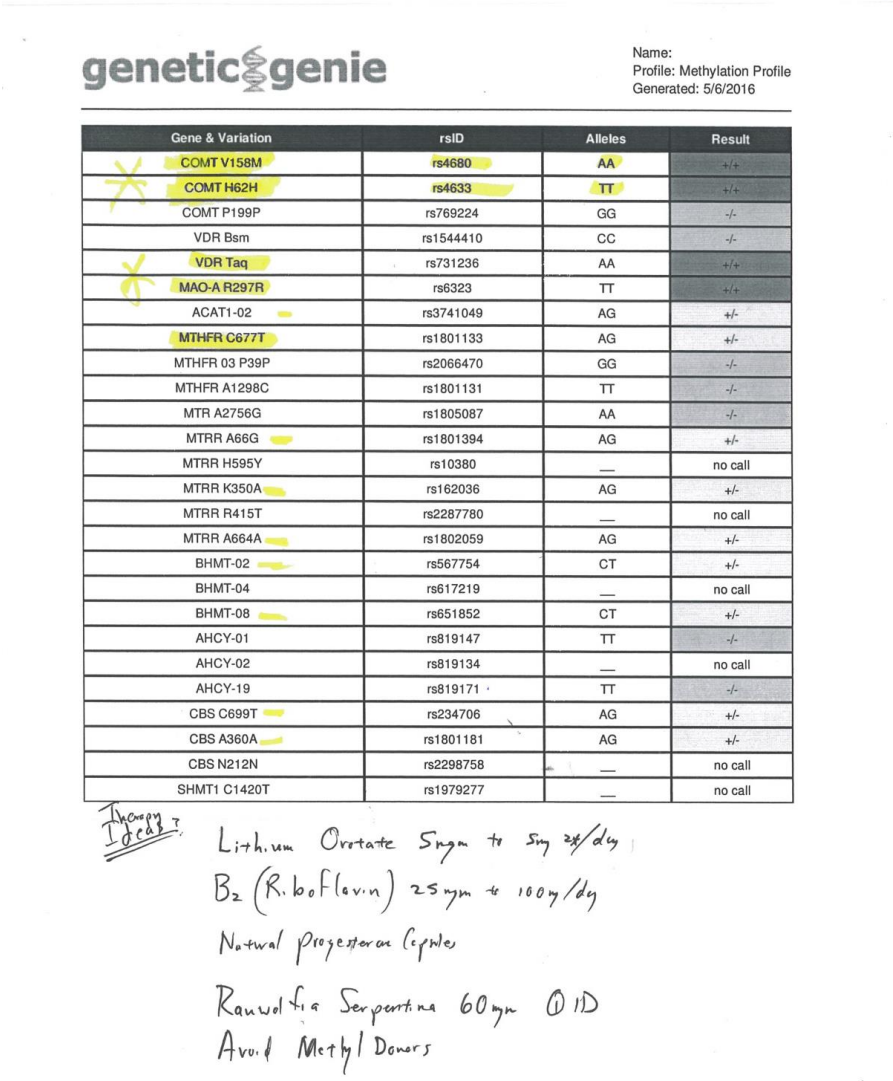
Borderline deficiencies include:

Manganese	Insulin	Magnesium	Glutathione
Spectrox	Immunidex		





Ahah! He had Hetero C677T



geneticgenie

Name:
Profile: Methylation Profile
Generated: 5/6/2016

Gene & Variation	rsID	Alleles	Result
COMT V158M	rs4680	AA	+/+
COMT H62H	rs4633	TT	+/+
COMT P199P	rs769224	GG	-/-
VDR Bsm	rs1544410	CC	-/-
VDR Taq	rs731236	AA	+/+
MAO-A R297R	rs6323	TT	+/+
ACAT1-02	rs3741049	AG	+/-
MTHFR C677T	rs1801133	AG	+/-
MTHFR 03 P39P	rs2066470	GG	-/-
MTHFR A1298C	rs1801131	TT	-/-
MTR A2756G	rs1805087	AA	-/-
MTRR A66G	rs1801394	AG	+/-
MTRR H595Y	rs10380	__	no call
MTRR K350A	rs162036	AG	+/-
MTRR R415T	rs2287780	__	no call
MTRR A664A	rs1802059	AG	+/-
BHMT-02	rs567754	CT	+/-
BHMT-04	rs617219	__	no call
BHMT-08	rs651852	CT	+/-
AHCY-01	rs819147	TT	-/-
AHCY-02	rs819134	__	no call
AHCY-19	rs819171	TT	-/-
CBS C699T	rs234706	AG	+/-
CBS A360A	rs1801181	AG	+/-
CBS N212N	rs2298758	__	no call
SHMT1 C1420T	rs1979277	__	no call

Therapy Ideas?

Lithium Orotate 5mgm to 5mg 2x/dy

B_2 (Riboflavin) 25mgm to 100mg/dy

Natural Progesterone Cycles

Rauwolfia Serpentina 60mgm QID

Avoid Methyl Donors

Methylation Profile generated by GeneticGenie.org

Page: 1 of 7

Plus

COMT X 2
MAO-B

All bad.

PATIENT #3

Interesting Labs on a 59 yo lady

guideline. JCEM. 2011 Jul; 96(7):1911-30.

C-Reactive Protein, Cardiac	1.47		mg/L	0.00 - 3.00	01
	Relative Risk for Future Cardiovascular Event				
	Low			<1.00	
	Average			1.00 - 3.00	
	High			>3.00	
* Testosterone, Free, Direct					
Free Testosterone(Direct)	1.7		pg/mL	0.0 - 4.2	02
Thyroid Antibodies					
Thyroid Peroxidase (TPO) Ab	11		IU/mL	0 - 34	01
Thyroglobulin Antibody	Will Follow		IU/mL	0.0 - 0.9	01
Thyroglobulin Antibody measured by Beckman Coulter Methodology					
Vitamin B12	518		pg/mL	232 - 1245	01
Progesterone	1.9		ng/mL		01
		Follicular phase		0.1 - 0.9	
		Luteal phase		1.8 - 23.9	
		Ovulation phase		0.1 - 12.0	
		Pregnant			
		First trimester		11.0 - 44.3	
		Second trimester		25.4 - 83.3	
		Third trimester		58.7 - 214.0	
		Postmenopausal		0.0 - 0.1	
Insulin	4.8		uIU/mL	2.6 - 24.9	01
Ferritin, Serum	55		ng/mL	15 - 150	01
* Triiodothyronine (T3), Free	6.5	High	pg/mL	2.0 - 4.4	01
**M005-IgG Candida albican	26.9	High	ug/mL	0.0 - 1.9	02

**

This test was developed and its performance characteristics determined by LabCorp. It has not been cleared or approved by the Food and Drug

Opinions on Free Tes levels in women?

With NO symptoms what do we do about her HIGH FT3?

Interesting Labs on a 59 yo lady

Patient Details
DOB: 10/19/1958
Age(y/m/d): 059/09/11
Gender: F SSN:
Patient ID:

Specimen Details
Date collected: 07/30/2018 1530 Local
Date received: 07/31/2018
Date entered: 07/31/2018
Date reported: 08/01/2018 0811 ET

Physician Details
Ordering:
Referring:
ID:
NPI:

General Comments & Additional Information
Total Volume: Not Provided **Fasting:** No

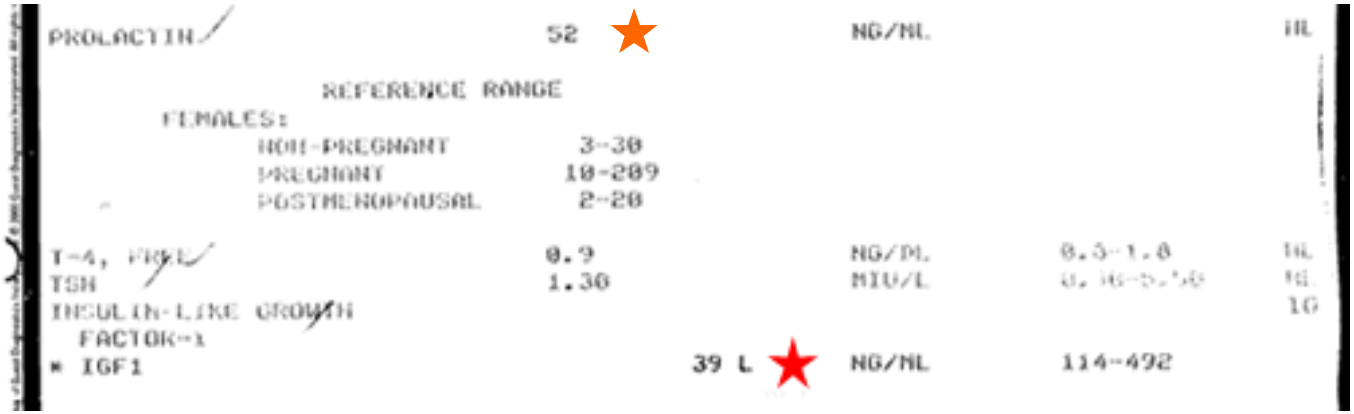
Ordered Items
IGF-1

TESTS	RESULT	FLAG	UNITS	REFERENCE INTERVAL	LAB
IGF-1					
Insulin-Like Growth Factor I	174	High	ng/mL	46 - 172	01

01 BN LabCorp Burlington Dir: William F Hancock, MD
1447 York Court, Burlington, NC 27215-3361
For inquiries, the physician may contact Branch: 435-673-8266 Lab: 800-788-9743

Your thoughts on this IGF-1 lab result and range?

A very low IGF-1—NO DOUBT!



PROLACTIN	52 ★		NG/ML		IR
REFERENCE RANGE					
FEMALES:					
NON-PREGNANT	3-30				
PREGNANT	10-209				
POSTMENOPAUSAL	2-20				
T-4, FREE	0.9		NG/DL	0.5-1.8	IR
TSH	1.36		MIU/L	0.46-5.46	IR
INSULIN-LIKE GROWTH FACTOR-1					IR
* IGF1		39 L ★	NG/ML	114-492	

Normal Prolactin level.

I've also seen an IGF-1 of 21 ng/ml – my lowest one.

Can aging cause pituitary decline?

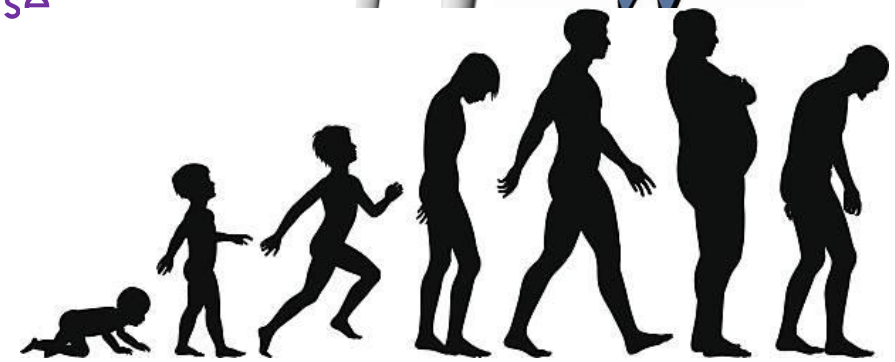
No, but trauma can.

"Aging" is not just a magical blanket disease but life itself is associated with specific incidents, diseases, and traumas that can cause a decline.

Malnutrition/Malnourishment can.

Genetic malnutrition can (i.e. MTHFR, MTRR, etc)

And just being weird does not cause pituitary damage either.



AGAIN – Is HGH safe to give?

J Clin Endocrinol Metab. 2013 Mar;98(3):980-8. doi: 10.1210/jc.2012-2684. Epub 2013 Jan 23.

Prospective safety surveillance of GH-deficient adults: comparison of GH-treated vs untreated patients.

Hartman ML[1], Xu R, Crowe BJ, Robison LL, Erfurth EM, Kleinberg DL, Zimmermann AG, Woodmansee WW, Cutler GB Jr, Chipman JJ, Melmed S; International HypoCCS Advisory Board.

⊕ **Collaborators (173)**

⊖ **Author information**

[1]Lilly Research Laboratories, Indianapolis, Indiana 46285, USA.

Abstract

CONTEXT: In clinical practice, the safety profile of GH replacement therapy for GH-deficient adults compared with no replacement therapy is unknown.

OBJECTIVE: The objective of this study was to compare adverse events (AEs) in GH-deficient adults who were GH-treated with those in GH-deficient adults who did not receive GH replacement.

DESIGN AND SETTING: This was a prospective observational study in the setting of US clinical practices.

PATIENTS AND OUTCOME MEASURES: AEs were compared between GH-treated (n = 1988) and untreated (n = 442) GH-deficient adults after adjusting for baseline group differences and controlling the false discovery rate. The standardized mortality ratio was calculated using US mortality rates.

RESULTS: After a mean follow-up of 2.3 years, there was no significant difference in rates of death, cancer, intracranial tumor growth or recurrence, diabetes, or cardiovascular events in GH-treated compared with untreated patients. The standardized mortality ratio was not increased in either group. Unexpected AEs (GH-treated vs untreated, $P \leq .05$) included insomnia (6.4% vs 2.7%), dyspnea (4.2% vs 2.0%), anxiety (3.4% vs 0.9%), sleep apnea (3.3% vs 0.9%), and decreased libido (2.1% vs 0.2%). Some of these AEs were related to baseline risk factors (including obesity and cardiopulmonary disease), higher GH dose, or concomitant GH side effects.

CONCLUSIONS: In GH-deficient adults, there was no evidence for a GH treatment effect on death, cancer, intracranial tumor recurrence, diabetes, or cardiovascular events, although the follow-up period was of insufficient duration to be conclusive for these long-term events. The identification of unexpected GH-related AEs reinforces the fact that patient selection and GH dose titration are important to ensure safety of adult GH replacement.

PMID: 23345098 [PubMed - indexed for MEDLINE] PMCID: PMC3677286 **Free PMC Article**

THE END

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