

MH Hotline Update

MHAUS Strategic Meeting 2020

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August 8, 2020

HLC Meeting Sept 2019, Chicago



25 Year Service Awards

- ▶ Dr. Cynthia Wong
- ▶ Dr. Kumar Belani

Hotline stats and Data collection

Interesting Cases (8)

Genomics Study

Registry Update

Succinylcholine and Dantrolene in ACS

Genetic Testing - US, Canada, Europe

The End of MH

HLC Meeting Sept 2019, Chicago

► Can we refine and improve hotline data collection?

Current Issues:

- Data collection is time consuming and labor intensive
- Lack direct input from HLC
- >40 data fields, many incomplete, free text fields
- Lack of follow-up after call complete

HLC Meeting Sept 2019, Chicago

- Define a Purpose/Goal for data collection:
 - Target education of providers about signs/sx MH, especially non-anesthesia providers
 - Connect to Registry (AMRA) and add follow-up
- Ideas for Improvement:
 - Collect high yield data and shift some data collection to AMRA
 - Consultant survey - improve accuracy of “diagnosis” field and key clinical signs
 - Caller survey- follow-up and HL service feedback
 - Caller email - introduce the survey and provide education

Call made to MH Hotline and recorded by

MedicAlert sends weekly call report to Hotline

Hotline Coordinator sends the **Caller Email** to MH Hotline Caller to advise a QA survey will be sent to them soon

Hotline Coordinator sends recordings on Monday (of the prior week's calls) to Kristee Rosen for transcription into RedCap

Hotline Coordinator continues to send "old" hotline recordings/reports to Kristee for transcription

Kristee completes the transcription of each report into RedCap it is given a unique Record ID (with a temporary numbering system)*

** Once all old records are entered, the new records will be converted to continue forward from last number of the old*

Kristee continues transcribing reports using chronological numbering system

Kristee sends **Caller survey link** (housed inside RedCap under unique

Kristee sends **HLC survey link** (housed inside RedCap under unique Record

Caller Email

Thank you for calling the MH Hotline.

HOTLINE SURVEY

We would like to evaluate and improve our service to you.

Please complete a brief survey to let us know about your experience with the hotline.

You will receive the survey link. In the next few days.

WHO ARE WE?

Hotline consultants are a group of dedicated physician volunteers who are experts in the management of MH.

<https://www.mhaus.org/about/mh-hotline-consultants/>

QUICK REFERENCE GUIDE FOR POST EPISODE MANAGEMENT

To help your team care for the patient in the next few days, here is a quick reference guide for post MH episode

management. Also refer to: <https://www.mhaus.org/healthcare-professionals/>

Caller Email

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1. ICU care for 24-48 hours

Monitor and Document:

ETCO2
HR and Rhythm
Minute Ventilation
Oxygen Saturation
Core Temperature
Muscle Tone
Urine output and color

Potential Complications of MH

Change in consciousness level
Cardiac dysrhythmias and dysfunction
Pulmonary edema
Renal dysfunction (acute tubular necrosis)
DIC
Hepatic Dysfunction
Muscular weakness
Compartment syndrome

Laboratory Studies:

Baseline and Every 8 Hours
Blood gas (pH, PaCO2, PaO2, Base excess)
Lactate
CK
K
Baseline, repeat if necessary
Creatinine, repeat if rhabdomyolysis
Coagulation studies, repeat if evidence of bleeding

Caller Email

2. Continue Dantrolene (maintenance dose of 1mg/kg every 6 hours) and watch for signs of recrudescence.

<https://www.mhaus.org/healthcare-professionals/mhaus-recommendations/dantrolene-administration-after-an-mh-event/> ****Warning - Dantrolene is a muscle relaxant and continued ventilatory support may be necessary****

***Alternative infusion dosing:** Dantrolene infusion dose = 0.25mg/kg/hr. Infusion requires frequent IV checks or central line use to prevent tissue necrosis due to IV extravasation. Infusion dosing must also take into consideration that dantrolene should be given within 6 hours of mixing.*

Signs of Recrudescence (usually in first 16 hours):

- Inappropriate hypercarbia and respiratory acidosis
- Inappropriate metabolic acidosis
- Inappropriate hyperthermia >38⁰C
- Skeletal muscle rigidity

Caller Email

3. Dantrolene can be stopped after 24 hours if the patient is meets criteria for stability, or the interval doubled for another 24 hours.

Signs of Stability:

Metabolic stability for 24 hours

Core temperature < 38^oC

CK declining

No myoglobinuria

No muscle rigidity

4. Complete an AMRA (Adverse Metabolic Reaction to Anesthesia) Form

This enrolls the patient in the North American MH Registry (NAMHR).

Follow this link: <https://anest.ufl.edu/namhr/>

Contact Amy Gunnett at NAMHR to guide you through the process

Phone: 1-888-274-7899; Email: agunnett@anest.ufl.edu

Caller Email

5. Further Investigation

Consult an MHAUS Hotline Expert for recommendations.

Link to ask the expert email : <https://www.mhaus.org/cfw/index.cfm?controller=kb&action=question-form&vchPermalink=/healthcare-professionals/>

Potential Recommendations:

- Referral for genetic testing or muscle biopsy for MHS (<https://www.mhaus.org/testing/>)
- Referral to neurologist for work-up of underlying myopathy

MHAUS

Please also consider joining or contributing to MHAUS, a non-profit organization committed to promoting the optimum care and scientific understanding of MH and related disorders. Donations support the Hotline as well as vital research in the field.

Membership: <https://my.mhaus.org/page/membershipinfo>

Donation: <https://www.mhaus.org/about/donation-options/>

Caller Survey

Why did you call the MH Hotline?

- Question about an upcoming case
- Aid with differential diagnosis
- Aid with management of suspected MH crisis
- Dantrolene question
- Other

If you selected other, please explain why you called the MH Hotline.

Type N/A if you did not select other above.

Caller Survey

Was your question/concern answered?

- Yes
- No

How long did it take to connect with a hotline consultant?

- 5 minutes or less
- 5 - 10 minutes
- Greater than 10 minutes

If you called regarding a potential MH crisis, did the consultant aid in differential diagnosis?

- Yes
- No
- N/A

Caller Survey

How helpful was the MH Hotline Consultant to your case?

- Extremely helpful
- Very helpful
- Slightly helpful
- Not helpful at all

Did the MH Hotline Consultant make you feel more confident/ comfortable with your management and/or diagnosis?

- A. Yes
- B. No

What was your original working diagnosis when you called the Hotline?

Caller Survey

What is the current working diagnosis of your patient? (check one)

- Malignant Hyperthermia
- Hypoventilation
- Infection/inflammation
- Machine/equipment malfunction
- CO2 insufflation
- Iatrogenic overheating
- Transfusion reaction
- Endocrine disorder (thyroid storm, pheochromocytoma)
- Substance abuse (Ecstasy, Cocaine, Amphetamines)
- Serotonin toxicity

Additional current working diagnosis choices

- Neuroleptic malignant syndrome
- Hypoxic encephalopathy/hypothalamic injury/ischemia
- Salicylate overdose
- Central anticholinergic syndrome
- Other (please specify in the comments section below)

Caller Survey

What diagnostic information have you received since the call? Labs, studies, consults?

Would you like further assistance from an MH expert?

[Click to consult an MH Hotline Expert for recommendations.](#)

- Yes
- No

Do you have any additional comments or information regarding your MH Hotline call?

Do you have any feedback on improvements that could be made to the MH Hotline operation?

Consultant Survey

MH HOTLINE CONSULTANT QUESTIONS

What was the time and date of call?

Was the call an active case?

Yes

No

If yes, which best describes your impression of the diagnosis?

Not MH

Unlikely MH

Possibly MH

Strongly suspect MH

Consultant Survey

Should an AMRA be filed? [Yes/No]

Yes - > triggers an email to registry

If not an active case (question only), what was the question?

MHS patient management

Assess risk for MH

Dantrolene dose/preparation

Other *[space for input]*

Do you think the call should have been handled differently?

Refer caller to email

Refer caller to website

Consultant Survey

If not MH, what is the most likely diagnosis?

Hypoventilation

Infection/inflammation

Machine/equipment malfunction

CO2 insufflation

Iatrogenic overheating

Transfusion reaction

Endocrine disorder (thyroid storm, pheochromocytoma)

Substance abuse (Ecstasy, Cocaine, Amphetamines)

Serotonin toxicity

Neuroleptic Malignant Syndrome

Hypoxic encephalopathy/Hypothalamic injury/ischemia

Salicylate overdose

Central anticholinergic syndrome

Consultant Survey

This form is to submit your feedback on an MH Hotline call during which you were the MH Hotline Consultant. Thank you for your valuable input! HLC NAME:

Patient sex

- male
- female
- no information

Patient age

- 0 - 10 years
- 11 - 20 years
- 21 - 60 years
- > 60 years
- no information

Patient body weight

- < 10 kg
- 10 - 20 kg
- 21 - 40 kg
- 41 - 60 kg
- 61 - 80 kg
- > 80 kg
- no information

Family history of MH

- yes
- no
- no information

Type of surgery [Please give a short description of the type of surgery here.]

- no information

Ventilation

- spontaneous
- mechanical
- assisted
- no information

Maximum minute ventilation

Please indicate the maximum [l/min].
Valid range: 0 - 30 l/min

Arrhythmia

- yes
- no
- no information

Increased CO₂

Please indicate the maximum CO₂ [kPa].
Valid range: 4 - 25 kPa

_____ kPa

- no information

Timing: CO₂

Time [minutes] from induction of anesthesia to 1st evidence of increase in CO₂ production.

_____ minutes

- no information

Hyperthermia

Please indicate the maximum temperature [°C].
Valid range: 35 - 45 °C

_____ °C

- no information

Timing: temperature

Time [minutes] from induction of anesthesia until temperature increase of 1°C.

_____ minutes

- no information

Charcoal Filters

- yes
- no
- no information

Dantrolene dose [mg]:

Treatment during first 2 hours after diagnosis.
Valid range: 0 - 2'000 mg

_____ mg

- no information

Dantrolene side effects

- Respiratory failure
- Phlebitis/Tissue necrosis

Recrudescence of MH

- yes
- no
- no information

Survey Completion

Survey responses **returned** will enter directly under the RedCap unique

Hotline Coordinator will see **both surveys sent** from within RedCap via internal RedCap

Hotline Coordinator will follow-up with both Caller and HLC to encourage survey completion

When survey is filled out by caller and HLC via link, Hotline Coordinator receives an email that it completed and removes from list