Animal Type	GAN	Preferred ID	Taxonomy	Sex	Birth Date
Individual	HBV25-02693	C50004 / Tula-Tu	Elephas maximus/Asian elephant	Female	01/Feb/2025

06/Mar/2025

Clinical note

Date	Time	Note Author
06/Mar/2025	00:00	Taylor Bliss
Significant	**Private**	**Active Problems**
No	No	~

Note Subtype: General

Notes/Comments

Adult Elephant EEHV Shedding Update:

Samples from 3MAR25:
A90136 sample: EEHV1 10vge/rxn; EEHV1A (-) & EEH1B (+)
All other adult elephant shedding negative.

Plan to recheck adult elephant shedding weekly during calf's first year of life.

Animal Care Staff Medical Summary

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Calendar Items

Date	Title	Assigned To	Done
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03/Mar/2025

Clinical note

Date	Time	Note Author
03/Mar/2025	00:00	Carlos Sanchez
Significant	**Private**	**Active Problems**
No	No	~

Note Subtype: Medical Consultant Report

Notes/Comments

Reproductive specialist (Dr. Janine Brown) expert opinion about putting the calf together with the adults.
Dr. Brown is an elephant reproductive/endocrinologist expert at the SNZP and in 2020 Dr. Brown received an honorary doctoral degree in veterinary medicine from Princess Sirindhorn Debaratanasuda Kitivadhanadulsobhak at Chiang Thailand where she has been working for several years in different projects including EEHV in elephants in Thailand. Her lab has published a significant number of scientific manuscripts in EEHV.

Dr. Brown: From my experience, **females will be anestrus for at least a year if a calf is nursing well.** The best way to check is through hormones of course, although we cannot predict the first postpartum ovulation and females have conceived on that. However, I agree it is better to expose the calf to as many elephants as possible to expose them to EEHV while the maternal antibodies are high. **Once she does have a cycle, YES, you can easily predict when it is safe to put her with whoever you like and separate just during the fertile window (follicular phase).** In summary: From a risk perspective, it is better to expose her early on and keep her exposed. The chances of conceiving on the first cycle are slim.

A: All experts agree that exposing the calf as often as possible to all adults as much as possible is important, risk for male to mount the female is low to very low. The concern of juvenile male hurting the calf is present, however is short term and the risk of not exposing the calf now is a long term (next 10-15 years).

P: Cont. recommending putting the calf with all the adults ASAP, as often as possible and for as long sa possible to expose the young calf to the different EEHV strains in the barn and allow her to mount her own immunity

Animal Care Staff Medical Summary

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Calendar Items

Date	Title	Assigned To	Done
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25/Feb/2025

Clinical note

Date	Time	Note Author
25/Feb/2025	00:00	Carlos Sanchez

Animal Type	GAN	Preferred ID	Taxonomy	Sex	Birth Date
Individual	HBV25-02693	C50004 / Tula-Tu	Elephas maximus/Asian elephant	Female	01/Feb/2025

Significant	Private	Active Problems
No	No	~

Note Subtype: Medical Consultant Report

Notes/Comments

Expert's opion about putting the calf with all adult elephants to maximize [EEHV] exposure during the time the calf is protected with maternal antibodies.
Hx: Calf is currently only spending time with mother and 2 female adults but not with bulls; juvenile male Samudra carries the EEHV1A that was found to be responsbile for the death of elephant calf Lily in Nov 2018. The current recommendation from the OZ veterinarians is to expose this calf as much as possible now that the calf has circulating antibodies from mother.

Experts consulted: Dr. Christine Molter - Director, Animal Health Houston Zoo and Dr. Lauren Howard, ex Houston Zoo veterinarian in charge of the EEHV response plan, ex-Head Veterinarian SDZ-SP and EEHV-AG executive committe.

Dr. Molter: Good to hear from you.
We do have a multigenerational herd here too. Our herd curator Rob Bernardy (rbernardy@houstonzoo.org) and manager Kristin Windle (kwindle@houstonzoo.org) are a wealth of information regarding the intricacies of introducing calves to the herd and my knowledge is definitely vet/biased and not in the nitty gritty of daily life at the barn. You and/or your team from the clinic or barn are welcome to reach out to them anytime. I understand the concern about wanting to get the calf exposed as soon as possible/as often as possible while still having maternal antibody protections. We've talked about "snot soup" (Daryl's term!) to inoculate calves with trunk washes from adults, but ultimately elected to just let the calves mix and mingle with most/all herd mates as often as possible, in as many combinations as possible, and as behavior allows starting a few days after birth – though in theory snot soup and mingling with the herd are achieving the same end. Do you think Samudra would try breeding behaviors if mom was in lactational anestrous still? Or, do you think contact in PC is possible – like in stalls next to each other for trunk to trunk contact? Or, even swapping yards to go through where his cooties have been may be a small step in getting the team comfortable with giving them more direct contact? I agree with you that getting the calf exposed during early life is critical.

Dr. Howard: I know we put our fairly young calves out with our bull Thai pretty early on in Houston. I can remember photos of tiny tiny babies next to a giant bull. Thai was a very good bull and very patient and careful around the littles. I don't remember any concerns about mounting of the mom at all…. They weren't related though so maybe we just didn't worry about it. Also, Thai is a champion heat detector and never wasted time if they weren't cycling.
I do agree that it's not likely for her to cycle and become pregnant THIS soon. Could you compromise and measure hormones in blood or feces or urine to make your colleagues feel better about it? A couple of baseline results may put everyone at ease?
I do agree early and frequent socialization is important for EEHV as well as lots of other reasons.

A: 2 EEHV experts have confirmed that the sooner the calf gets exposed ASAP/as often as possible while having maternal antibody protection is critical

P: Emphasize to animal care staff the importance of early exposure to most/all herd mates as soon as possible

Sero-profile all the adult elephants at BCM to obtain bseline information - to know which adult has been infected with which type of EEHV and their level of protection

Consider sending weekly TW from all adult elephants to NEHL as sueveillance to determine what animals are "robust" shedders vs who infrequently sheds; also what strains they are shedding with the understanding that shedding paterns vary over time and will ONLY detect if one of the animals IS shedding.

Animal Care Staff Medical Summary

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Calendar Items

Date	Title	Assigned To	Done
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17/Feb/2025

Clinical note

Date	Time	Note Author
17/Feb/2025	00:00	Carlos Sanchez

Significant	Private	Active Problems
No	No	~

Note Subtype: General

Notes/Comments

Initial plan for antibody for EEHV testing and summary of email sent to elephant manager with regard to exposure of the calf to all elephants.
Hx: Calf born on Saturday Feb 1 at 4:29pm; due to set up it was decided to forgone the neonatal exam as calf was apparently healthy and having it nurse and bond with mother was deemed more important than separating it from the mother with the associated stress. The calf has been doing well and now is spending time also with the other 2 females.

No neonatal exam and no blood sample has been obtained to monitor Abys at BCM

In conversations with Dr. PL at BCM the following was stated:
For the baby, when you can reliably train for blood/serum draws, I'd say every 3-6 months. The first year generally they are pretty safe, but its important to see where their titers are after 1 year. Do you have a birth sample or any sample from the first couple weeks? This is also really good to get a baseline (High baseline, probably longer for them to trend down to a vulnerable state, low baseline, quicker). A sample from the Dam will give you a good idea of what the calf got in terms of levels and Abys to the different EEHV types.

Email sent to manager with regard to exposing the calf to ALL elephants housed at OZ while the calf is protected.

Emails sent on Feb 13, 2025:

1st email: Vets wanted to meet with you to emphasize the importance of having the calf exposed at an early age, and as often as possible [and for longer periods of time] to ALL elephants. The theory we have in the EEHV-Advisory group, is that the more exposure at an age that the calf is protected by maternal Abs (about 1 y.o), it'll get to build an adequate

Animal Type	GAN	Preferred ID	Taxonomy	Sex	Birth Date
Individual	HBV25-02693	C50004 / Tula-Tu	Elephas maximus/Asian elephant	Female	01/Feb/2025

immunity that could protect it when exposed to EEHV and not develop HD. We do not know when an elephant is shedding and what type of EEHV is shedding; so **prolonged** and **continuous** contact [to elephants shedding] is the best way to provide this exposure while protected. The reason I wanted to meet with you is because based on sequencing of the virus that killed elephant calf Lily back in 2018 was identical, in at least 5 loci, to the one Samudra had in 2011; we can safely assume that Samudra shed it again in 2018 and Lily was not protected and developed HD; she was < 1y when Samudra had the viremia in 2011 and 5 y.o in 2018. *NOTE*: it was corrected later on that Lily elephant was actually born in 2012 not in 2011 and as such was not present during the 2011 viremic event and evidently not exposed.
I know you had mentioned you couldn't/didn't want to put Samudra with Rose for breeding reasons which makes total sense; but we wanted to provide our rationale on early and continuous exposure; we are happy to work with you on options to not get RS mounted/pregnant, I'm ccing Nadja as her team could be really important to develop an strategy.

Elephant manager replied: We are on the same page! Plan is to introduce the kid to Samudra through bollards in the corral, so she receives the benefit of exposure without the undesirable behavior. I was thinking as soon as couple weeks from now but depends on how the herd is doing and the kid's strength. Let me know what best practice would be regarding timeline and we can work off that

However this was not deemed adequate for exposure to the calf and the following response to manager on the same day (Feb 13, 2025:)

2nd email: As far as when to start the exposure: the sooner the better with the understanding that it is a process and needs time and we should not rush it but….
More important than when to start the exposure, is our concern that limited exposure (calf not being with the Samudra at all times but only with limited contact [through the bollards] could not be enough exposure [to mount appropriate immunity that will protect it when maternal antibody protection is no longer present]. As I mentioned it, we do not know when an elephant sheds EEHV (and what type it sheds) so the only way to be sure that a calf is exposed to all types [of EEHV] is to expose it at all times.
This is the theory behind what we call at the EEHV-AG the "calf-kindergartens" (that wild elephants that have many calves and large groups are always exposed with all types of EEHV at *all times*, allowing them to mount proper immunity).

A: No blood sample from calf yet to determine basline Abys levels but serum from blood sample from mother from birth day: Feb 01 and subsequent weekly samples (Feb 4 and 11th) are available
P: Submit blood from mother to determine what level of Abys the calf got for the different types of EEHV.
Stress out the importance of a a blood sample from the calf to elephant manager
Emphasize the importance of having this calf exposed to all elephants, principally juvenile male Samudra as we know it's a carrier of the EEHV-1A strain that was fatal to calf Lily

Animal Care Staff Medical Summary

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Calendar Items

Date	Title	Assigned To	Done
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Clinical note

Date	Time	Note Author
17/Feb/2025	00:00	Carlos Sanchez
Significant	**Private**	**Active Problems**
No	No	~

Note Subtype: General

Notes/Comments

Proc: Opportunistic visual while checking mother's ventral edema.
Hx: Keepers report this calf had a lot of energy this a.m.
Visual: Calf is BAR, moving around more coordinated than prior CRS visual; exceptional trunk coordination for a calf of this age. Observed in close proximity the following areas:
Eyes: NSF, no discharge, no abnormalities
Trunk/nose: No discharge, normal in color
Oral: Observed openign mouth when nursing; normal MM color, no abnormalities, no discharge
Allowed CRS to scratch head without problem

A: Apparently healthy female calf
P: Monitor opportunistically

Animal Care Staff Medical Summary

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Calendar Items

Date	Title	Assigned To	Done
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11/Feb/2025

Clinical note

Animal Type	GAN	Preferred ID	Taxonomy	Sex	Birth Date
Individual	HBV25-02693	C50004 / Tula-Tu	Elephas maximus/Asian elephant	Female	01/Feb/2025

Date 11/Feb/2025 **Time** 00:00 **Note Author** Josie Rose

Significant No **Private** No **Active Problems** ~

Note Subtype: General

Notes/Comments

OPPORTUNISTIC VISUAL

S/O: Observed both dam (94122) and calf (C50004) in Forest Hall. Both elephants are bright, alert, and responsive. Calf's abdomen is becoming "round," suggesting adequate milk intake. Calf appropriately follows dam, and moves in a coordinated manner. Dam has visible mild ventral edema, extending from ~1 ft cranial to the umbilical region to the inguinal region. Edema is ~12-15 cm thick. Spoke with curator SL and there are no concerns about cracking or damage to the skin.
A: Mild ventral edema (94122); common phenomenon observed postpartum in dams, etiology is not fully described
Appropriately bonded dam and calf
P: Team will attempt hydrotherapy this afternoon.

JBR 11Feb2025

Animal Care Staff Medical Summary

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Calendar Items

Date	Title	Assigned To	Done
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10/Feb/2025

Clinical note

Date 10/Feb/2025 **Time** 00:00 **Note Author** Carlos Sanchez

Significant No **Private** No **Active Problems** ~

Note Subtype: General

Notes/Comments

Proc: Opportunistic visual while checking mother's ventral edema.
Hx: Calf reported to have potentially gained weight and now being 210lbs; however weight was obtained in the ERD scale that does not appear to be sensitive enough for this size animal.

Visual:
S/O: Calf is BAR, moving more normally next to mother and even trotting at some point with good coordination (normal for a calf this age); observed nursing (uneventfully). No evidence of oral, nasal, ocular discharge, belly and umbilicus appear WNL.

A: Apparently healthy female calf, mother taking care of it appropriately

Animal Care Staff Medical Summary

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Calendar Items

Date	Title	Assigned To	Done
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07/Feb/2025

Clinical note

Date 07/Feb/2025 **Time** 00:00 **Note Author** Carlos Sanchez

Significant No **Private** No **Active Problems** ~

Note Subtype: General

Notes/Comments

Proc: Daily vet recheck.
Hx: Keepers report normal ambulation, attitude, urination and nursing. Yesterday CRS noted that calf was observed walkign and "swinging" the RR limb outwards. This a.m on video evaluation calf presents this ambulation on both rear limbs and appears to be related to "clumsiness" as it does it when walking "fast" trying to keep with mom.

Animal Type	GAN	Preferred ID	Taxonomy	Sex	Birth Date
Individual	HBV25-02693	C50004 / Tula-Tu	Elephas maximus/Asian elephant	Female	01/Feb/2025

Visual: Calf is BAR, observed nursing during visual (uneventful). Calf presents normal conformation, no eye, oral or nasal discharge noted; on ambulation calf appears to be walkign normally particularly when walking slow; when walking fast it appears sligthly uncoordianted but this maybe related to calf being still getting used to move at a faster speed. Very low level of concern if any.

A: Calf, apparently healthy
P: Veterinary visuals daily for now

Animal Care Staff Medical Summary

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Calendar Items

Date	Title	Assigned To	Done
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06/Feb/2025

Clinical note

Date	Time	Note Author
06/Feb/2025	00:00	Carlos Sanchez
Significant	**Private**	**Active Problems**
No	No	~

Note Subtype: General

Notes/Comments

Visual exam and update from animal care staff.
Hx: Elephant calf has been doing well and has bonded with mother. Calf has been reported by staff as nursing, defecating, urinating and acting normally; yesterday calf and mother were introduced to female Sung-Suring (after a couple of days on howdy intros). Intros went very well with no evidence of antagonist interactions.

Today veterinary staff was present during the introduction (2nd day) of calf - mother with Sung.
S/O: Calf is BAR, attempted to nurse on Sung but then found mother and latched uneventfully. Eyes, nares and oral appear normal. Subjectively, when calf was observed moving at fast pace (mother offered hay on the hanging enrichment device and moved fast to that location) it appears to move the RR limb outwardly on movement (swing movement). Checked with lead keeper DD and he agreed.

A: Apparently healthy calf but noticed a possible awkward ambulation when trotting on RR limb.
P: Requested to keep an eye on ambulation, umblicus, etc.
Visual tomorrow

Animal Care Staff Medical Summary

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Calendar Items

Date	Title	Assigned To	Done
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03/Feb/2025

Clinical note

Date	Time	Note Author
03/Feb/2025	00:00	Carlos Sanchez
Significant	**Private**	**Active Problems**
No	No	~

Note Subtype: General

Notes/Comments

Proc: Visual exam of calf today.
Hx: Calf born at +/-4:30 pm on Feb 1, 2025; birth was smooth, calf was up and moving within an hour and reported nursing few hours later the same day. In agreement with animal care manager it was decided not to separate calf for a neonatal exam in order to promote bonding with mom. Calf passed meconinium within 2 hours of birth and was moving normally after 4hrs post-birth.

Manager update today: Calf has been nursing normally; bond with mother is excellent and calf continues to follow mother and interact with her normally. Unable to get a weight so far, calf always with or very close to mother.

Visual:
S/O: Observed in FH from visitor side: Calf standing with normal conformation (although tail appears to have a kink - first noticed by CRS on birth and reported to manager today); normal ambulation; observed urinating and defecating (both normal); observed what appear to be nursing. During urination, it appears a female (vaginal folds observed apparently).

A: Apparently female (needs to be confirmed) elephant calf, 1 1/2 days old, appears healthy.

Animal Type	GAN	Preferred ID	Taxonomy	Sex	Birth Date
Individual	HBV25-02693	C50004 / Tula-Tu	Elephas maximus/Asian elephant	Female	01/Feb/2025

P: Monitor for now, neonatal/veterinary exam to be performed opportunistically

Animal Care Staff Medical Summary

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Calendar Items

Date	Title	Assigned To	Done
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01/Feb/2025

Clinical note

Date	Time	Note Author
01/Feb/2025	00:00	Tina Batek
Significant	**Private**	**Active Problems**
No	No	~

Note Subtype: General

Notes/Comments

Parturition Notes:

15:02: Wide-based stance, followed by production of a few fecal balls (normal size)

15:04: Wide-based stance, followed by production of additional feces, then urine (normal appearance). **Abdominal contraction and "tail flagging" noted in addition to appearance of bulge ventral to tail.** Elephant closed into corral

15:20: Visual exam. Subtle forward stretching with additional abdominal contractions (mild). Bulge remains apparent. Overall elephant appears calm and mostly comfortable

15:50: Fecal production (normal size)

16:10: Elephant remains comfortable, no increase in vulvar discharge. Some side stepping and subtle abdominal contractions. Bulge remains apparent. Normal appetite

16:23: Urine production (small amount)

16:24: Signs of discomfort: high-stepping, tail flagging, tense abdomen

16:25: **Wide-based stance with intesnified contractions.** Additional "tail-flagging," but remains relaxed

16:27: Tense abdomen with intensified contactions - elephant appears to be "pushing."

16:29: Delivery of calf; posterior presentation with hind limbs extended - allantois ruptured on contact with the ground

16:29: Dam begins to assist with removal of allantois - head freed shortly after

16:31: Calf sternal - assisted (unassisted at 16:40)

16:31: Dam continues to assist calf with standing; no evidence of aggression from dam

16:40: calf attempts to stand

16:41: Calf standing - assisted

17:11: Calf walking (coordinated walk at 17:05)

17:22: Calf vocalizations

18:04: Calf attempts to nurse

18:53: Calf sleeping. **Respiratory rate 16 brpm.**

19:08: Passing of meconium

19:09: Delivery of afterbirth; appears whole - total weight 15.9 kg. Normal on inspection. Sections of umbilical cord and placenta cut and placed into ziplock bags for submission to OVDL

21:00: Visual inspection of umbilicus (no findings of concern); umbilicus sprayed with betadine

22:00: Successful nursing

Assessment: Apparently healthy calf; no overt abnormalities (hands-on exam pending)
Plan: Allow for continued bonding of dam and calf; will plan for hands-on exam when able over the next few days (prioritize inspection of umbilicus and blood collection). In meantime, keepers are to continue topical application of betadine to umbilicus

Animal Care Staff Medical Summary

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Animal Type	GAN	Preferred ID	Taxonomy	Sex	Birth Date
Individual	HBV25-02693	C50004 / Tula-Tu	Elephas maximus/Asian elephant	Female	01/Feb/2025

Calendar Items

Date	Title	Assigned To	Done
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