

Daily veterinary updates from the Wellington Zoo team

- **Please note the duplicate information contained in the email trails has been deleted so that only the new information for each day is included for ease of reference. The full email trails can be found in the 'vet advice and reports' file**

13 July 2021

From: [REDACTED]
To: [REDACTED]; [Ian Angus](#); [Marine](#)
Cc: [HUHA Helping You Help Animals](#); [ingrid](#); [REDACTED]
Subject: Veterinary update for orca calf 13/07/21
Date: Tuesday, 13 July 2021 3:47:37 pm
Attachments: [Orca calf update 13-07-21.docx](#)

Hi everyone,

I've created a document of the vet results, findings and recommendations that we have so far for the orca calf at Plimmerton boat club, and I've attached it here. As time goes on and more information comes available, we'll keep updating you.

Today's 1pm stomach tubing with fluids was performed by vet [REDACTED] from HUHA and this went very well, so the follow up tubing at 5pm and at 9pm will be run by [REDACTED] also. DOC staff if you are happy with this plan and timing also?

Our team will be in when DOC arrives in the morning tomorrow (is that 7:30am again?) for the first treatments, which would be an injection of some medications and tube feeding – starting dilute formula feeds in the morning.

Any questions, comments, concerns please don't hesitate to get in touch.

Kind regards,

[REDACTED]

[REDACTED] BVSc, MVSc (Zoo Animal and Wildlife Health), MANZCVS (Avian Health)
Senior Veterinarian | Animal Care and Science | Wellington Zoo Trust
200 Daniell Street | Newtown | Wellington 6021
Ph [REDACTED]
E [REDACTED][@wellingtonzoo.com](mailto:[REDACTED]@wellingtonzoo.com) | W www.wellingtonzoo.com |

1) miCurrent medical assessment

- Blood tests:
 - Performed in-house at Wellington Zoo: biochemistry, PCV/TP, manual white cell count.
 - Awaiting results from veterinary laboratory: Complete blood count and blood parasite check, fibrinogen, lactate, total iron.
 - These results will take 2-3 days.
 - RESULTS SO FAR: our interpretation of the in-house testing is that there is mild-moderate anaemia present. There does not appear to have been recent significant blood loss from any external wounds, so the main possible causes we're considering for this at the moment are: blood parasites, gut parasites, other underlying disease. Anaemia can cause weakness and illthrift.
 - There are no indications that there is capture myopathy present.
 - **We are awaiting** a second opinion from cetacean vets on the interpretation of these blood results.
- Physical exam:
 - Superficial and deeper abrasions to the underside of the tail flukes and the underside of the chin.
 - He also has several deep lacerations near his tail fluke laterally to his spine.
 - On 12/07/21 at 6pm the animal was tilting to the right, variable amounts but up to 45 degrees. On the morning of 13/7/21 the tilting was still occasionally visible. Preliminary recommendations by cetacean vets are that possible reasons for this are: looking up and evaluating the situation (ie behavioural), myopathy (temporary or more severe), or tilting secondary to lung injury.
 - **We are awaiting** assessment of tilting videos by cetacean vets for additional opinions on this.
- Blow hole swabs:
 - Awaiting results from veterinary laboratory: blow hole cytology/culture (aerobic bacterial culture and fungal culture).
 - These results will take 3-6 working days for bacterial culture, and longer for fungal culture.
- Summary: our two main medical concerns as at 13/07/21 are the mild-moderate anaemia and the observed tilting. Further lab results and further cetacean vet opinions are pending to give better estimates of diagnosis and prognosis for these conditions.

Cetacean vets suggest: "The assumption is the calf stranded primarily due to maternal separation then weakness from malnutrition and inability to maintain itself at sea. However, that is not necessarily the case. There may be any number of additional problems with the calf that led to stranding and then there are the problems associated with stranding including muscle damage, pulmonary issues and even kidney damage and heart disease as with a capture myopathy scenario."

- To do:
 - **Please can someone try to collect us a faecal sample** when he passes one? It can be put in a clean (not necessarily sterile) container with a lid.
 - **Can someone please confirm our estimated age** for the animal? From memory I think someone told me 4-6 months?

2) Proposed medical/nutrition plan moving forward

For the period that the animal is away from his mother, he will require careful supportive care to maintain his strength and his health. The following are recommendations compiled from a range of cetacean vet recommendations. **Further information is pending and may result in updates to the following.**

- Closely monitor the animal's respiratory rate and the animal's behaviour and demeanour.
 - o In general.
 - o Before handling/feeding.
 - o Immediately after handling/feeding.
- Fluids
 - o His daily fluid requirements are 40-80ml/kg/d.
 - o We assume that there is a degree of dehydration present, so we will aim for >8L fluids per day (for an estimated 200kg body weight).
 - o For 12/07/21: 1L electrolyte solution by stomach tube at 7pm.
 - o For 13/07/21: 2L electrolyte solution by stomach tube at 9am, 2L by stomach tube at 1pm, 3L at 5pm (if this volume is tolerated), 3L at 9pm (if this volume is tolerated).
 - We initially started at 1-2L because we were carefully testing his stomach capacity, but advice has been he'll probably hold 3L so we plan to increase the volume this evening (13/07/21).
- Feeding plan
 - o We have an orca hand rearing formula sent through from Sea World in the US. We won't be able to find all of the ingredients here, but they have advised that some ingredients can be omitted or substituted for short term use.
 - o For 13/07/21 we will continue to just give fluids by mouth (no food).
 - o From the first feed on 14/07/21 we will start to introduce formula at a dilute rate. Dilution and frequency of feeds TBC, but based on preliminary feeding recommendations this will likely be recommended to be ~5 times a day (not overnight).
- Additional medications
 - o Cetacean vets have advised that we administer:
 - Dexamethasone by intramuscular injection once a day. This was started on the morning of 13/07/21.
 - Antibiotics by intramuscular injection twice a day. A long acting antibiotic was given on the afternoon of 12/07/21. A new antibiotic will be started on the morning of 14/07/21 and continue as twice a day injections from then on.
- Strength and fitness
 - o Allow the animal to swim in different directions, including circling in one direction and then in the other direction – to prevent overuse of some muscles and cramps. Possibly increase space available to increase amount/type of movements able to be exhibited – if safe and practical to do so.

3) Advice regarding management of disease between orca calf and humans, in both directions.

Some diseases of cetaceans can affect humans and vice versa, even if the cetacean/human that is the source of the disease appears clinically well. To reduce the potential for disease spread to or from cetaceans, we recommend:

- Wearing gloves and facemasks when in proximity to the animal.
- Washing hands carefully after being in proximity to the animal.
- Washing hands carefully prior to eating when on the response site.
- Minimising the number of people in proximity to the animal at all times.
- Use a foot bath when going in and out of the water.
- No dogs or other domestic animals on-site.
- Incorporate the above instructions into volunteer inductions at shift changes.

- (Work in progress: wetsuit cleaning protocols/recommendations).

14 July 2021

From: [REDACTED]
To: [REDACTED]; Ian Angus; Marine; [REDACTED]
Cc: [HUHA Helping You Help Animals](#); inorid [REDACTED]; [REDACTED]
Subject: Veterinary update for orca calf 14/07/21
Date: Wednesday, 14 July 2021 6:46:52 pm

Hi everyone,

A quick veterinary update for today:

1. Medical findings

Lab tests:

- Repeat blood tests taken today and run in house show no new/additional abnormalities.
- We are still awaiting results from the veterinary laboratory for samples taken Monday:
 - Complete blood count and blood parasite check, fibrinogen, lactate, total iron, blow hole swab culture (fungal and bacterial) and cytology.
- The cetacean vets we are communicating with think that what we initially interpreted as anaemia is actually within the normal reference range of orca calves of this age, so is currently of no concern.

Physical exam:

- There are still superficial and deeper abrasions to the underside of the tail flukes and the underside of the chin. There are also will several deep lacerations near his tail fluke laterally to his spine.
- Further video footage was sent through to cetacean vets of the animal's position in the water and movements in the water. They think his positioning and behaviour is probably normal, as far as it is able to be assessed in the space that he is in. Their reasoning for this is that the tilting behaviour is not consistent and that his respirations appear normal.

So currently the only known medical problems are the abrasions and lacerations. This is based on the diagnostic testing we have done and what is possible to assess on physical examination and distance examination. Due to the size of the animal and the limitations of our diagnostic testing, it is still possible that there is a disease condition present that predisposed him to being separated from his pod and that we have not been able to detect. We'll await further lab results.

The team on-site are going to attempt to collect us a faecal sample (thank you!).

2. Proposed medical/nutrition plan moving forward

His current medical care consists of:

Ongoing recording of respiratory rate, and also any observed defaecation and urination.

- This is being recorded by whale rescue volunteers (thank you!).
- He has been observed to defaecate every day at this stage.

-

Fluids:

- His daily fluid requirements are estimated to be 40-80ml/kg/d (8-16L per day).
- Today he received 3L fluids (1/2 strength vytrate solution) at each of four tubing events (= 12L total)

Feeding:

- He was started on an orca hand rearing formula today – 250ml at the first tubing, 375ml

15 July 2021

From: [REDACTED]
To: [REDACTED]; Ian Angus; Marine; [REDACTED]
Cc: [REDACTED]; inoric; [REDACTED]
Subject: Veterinary update for orca calf 15/07/21
Date: Thursday, 15 July 2021 6:01:56 pm

Hi everyone,

A veterinary update on Toa for today. Team HUHA and Whale Rescue please feel free to add to my updates if I've missed anything from our conversation or if you otherwise have anything to add!

1. Current medical findings

Lab tests:

- We have a few results back from the lab:
 - Complete blood count and blood parasite check – normal (but see below)
 - Fibrinogen levels (one way of testing for inflammation) – normal
 - Blow hole swab cytology (a measure of respiratory tract infection) – normal
 - Total blood iron levels – normal
 - The lab's interpretation of the blood results suggests a mild regenerative anaemia – worth noting here because the lab mentioned it, but we'll also bear in mind at this stage that the cetacean vets were not immediately concerned about this result. Something to monitor.
- We are still awaiting results from the veterinary laboratory for samples taken Monday:
 - Lactate, blow hole swab culture (fungal and bacterial).

Physical exam:

- There are still superficial and deeper abrasions to the underside of the tail flukes and the underside of the chin. There are also several deep lacerations near his tail fluke laterally to his spine.

So currently the only known medical problems are the abrasions and lacerations. This is based on the diagnostic testing we have done and what is possible to assess on physical examination and distance examination. Due to the size of the animal and the limitations of our diagnostic testing, it is still possible that there is a disease condition present that predisposed him to being separated from his pod and that we have not been able to detect. We'll await further lab results.

The team on-site are going to continue to attempt to collect us a faecal sample (thank you!).

2. Proposed medical/nutrition plan moving forward

His current medical care consists of:

Ongoing recording of respiratory rate, and also any observed defaecation and urination.

- Respiratory rate is being recorded by whale rescue volunteers (thank you!).
- He has been observed to defaecate every day at this stage.
 - Only one faecal was observed today, but further faecals may have been missed due to deteriorating weather conditions and choppy/murky water today.
- He has been observed to urinate in the last 24 hours (great observation thank you!)

-

Fluids/feeding:

- Orca hand rearing formula feeding continued today: 500ml at each of the first two feeds, 750ml at the third feed, and a plan to give 750ml at the final feed also.
- His daily fluid requirements are estimated to be 40-80ml/kg/d (8-16L per day).
 - So at each feed the total volume tubed was 3L, with the remainder of the volume to make up the total being vytrate electrolyte solution (1/2 strength).
- He was monitored for signs of gut upsets which may occur with the introduction of a new diet (monitoring for regurgitation, vomiting, signs of abdominal pain, bloating, increased frequency of defaecation and/or diarrhoea). None of these signs were observed.

Additional medications:

- Dexamethasone by intramuscular injection once a day. This was started on the morning of 13/07/21. Advice from the cetacean vets we've been communicating with suggests that we can start weaning this medication off at this stage, so tomorrow morning he will get a half dose (2.5ml)(16/07/21), and from 17/07/21 onwards he will no longer be receiving this medication.
- Antibiotics (enrofloxacin 5mg/kg) by intramuscular injection twice a day starting on the morning of 14/07/21 (a long acting antibiotic was given on the afternoon of 12/07/21). The cetacean vets have advised that a 7 day course of this medication should be sufficient given the blood and other test results, and how he is in himself. So this will be continued until 20/07/21 inclusive.
- Ingrid: I haven't been able to get hold of your recommended contact (will keep trying), but in the meantime I have asked the other cetacean vets your question about whether antifungal medications are recommended with the antibiotic course that he is on. The advice we have at this stage is that because our courses of antibiotics and dexamethasone are short and because there are not currently any signs of fungal infections, that these are not necessary at this stage. But worth asking about and bearing in mind!

Plan for regular monitoring:

- We're still putting together some monitoring parameters which will help us assess his health and welfare on a daily basis. Will keep you updated as this develops, it will likely involve semi-regular blood samples if possible (1-2x per week), respiratory rates, bowel movements, observations/videos of movement/behaviour etc – so similar to what we're already doing.
3. [Advice regarding management of disease between orca calf and humans, in both directions.](#)

This advice remains the same as at the last update.

4. [Other work in progress](#)

We've sent through to the HUHA team a set of veterinary considerations for transport (ie for ocean release) from the cetacean vets we've been communicating with. We'll have a bit more of a think about whether anything needs to be added/changed to this. I think most parties have this info at this stage, let me know if I have not sent it to you and you'd like to see a copy.

Wetsuit hygiene/biosecurity instructions are still a work in progress

Thanks so much everyone for all your time and expertise. If you have any questions or comments please don't hesitate to get in touch.

Kind regards,



16 July 2021

From: [REDACTED]
To: [REDACTED]; [Ian Angus](#); [Marine](#); [REDACTED]
Cc: [HUHA Helping You Help Animals](#); [ingrid](#); [REDACTED]
Subject: RE: Veterinary update for orca calf 15/07/21
Date: Friday, 16 July 2021 4:06:53 pm

Hello again to everyone!

Thank you all for your amazing continued care of the little calf! I'm just continuing on with a further update on how Toa is doing following the discussion from earlier this afternoon. I'll try to only include new information in this update. Please add anyone I may have forgotten to include!

Due to the change in weather, Toa was moved into a temporary pool yesterday around 5 PM. The move went smoothly and took 20-30 minutes. There have not been any changes noted in his behaviour since changing to the pool and his medical treatments and tubings are taking place at the same intervals. At the moment there is no filtration system in place so, as an alternative, the pool is being continuously filled with sea water via a pump and draining out excess water through holes in the side. The plan is to only keep Toa in the pool until it is safe enough to return him to the sea pen.

As we have increased the concentration of formula being fed, it was observed that Toa is beginning to show a few signs of abdominal discomfort immediately after feeds. He will cramp up and sink to the bottom of the pool briefly. This began last night and happened again this afternoon. In order to hopefully combat this we have come up with the solution of feeding him more frequently throughout the day (every 2 hours instead of every 4) so that he is getting smaller volumes of formula at each feed (but will still receive the same total daily volume). We will still try to increase his volume of formula fed by 50% each day in order to start increasing his caloric intake. It has been difficult to assess the frequency and consistency of his faecal output due to the murkiness/turbulence of water from weather. With increased

In terms of ongoing monitoring, we will continue to do what [REDACTED] has already discussed (semi-regular blood samples if possible (1-2x per week), respiratory rates, bowel movements, observations/videos of movement/behaviour) but may also consider adding in blow hole chuff cultures at least once but could repeat if any indication (we need to source the appropriate petri dish to collect these and confirm with Gribbles how it will need to be submitted), urine samples from first thing in morning prior to tubing to check UA and USG (this could be less frequent, maybe every 3 days or so), and body length and girth measurements (and possibly weights! if a suitable scale setup can be sourced which Ingrid is looking into). The body length, girth and weight measurements will be incredibly helpful both in helping to confirm an age and in ongoing monitoring of nutritional status.

For fluids and feedings tomorrow the plan is to give 700 ml formula with 1.5 liters 50% vytrate at 8 AM, 10 AM, and 12 PM. Then for the 2 PM, 4 PM, and 6 PM feeds he can receive 1 liter formula with 2 liters of 50% vytrate. (Total formula volume will be 5 L tomorrow compared to 3.5 liters today, a ~50% increase in volume). I'll email out a feed schedule sheet separately in case it is helpful. This will increase the total fluid volume he gets during the day by 3 liters but will still be within his recommended fluid needs of 40-80 ml/kg/day. If he is continuing to show signs of discomfort after any of these feedings please get in touch. [REDACTED] will be at work tomorrow at the

17 July 2021

From: [REDACTED]
To: [REDACTED]; Ian Angus;
[Manne](#);
Cc: [HUHA Helping You Help Animals](#); [ingric](#); [REDACTED];
Subject: RE: Veterinary update for orca calf 15/07/21
Date: Saturday, 17 July 2021 4:35:52 pm
Attachments: [image001.png](#)
[Toa Feed Schedule 18.7.21.docx](#)

Hey all, quick update from me today.

- Toa is going really well according to personnel on site – accepting feeds well, and no gastrointestinal comfort seen
- There is possibly a sewerage pipe burst somewhere near the bay, so concerns re: water quality. HUHA vet [REDACTED] is organising water testing.
- [REDACTED] got a urine sample and USG this morning of 1.017
- [REDACTED] mentioned possibly some oedema around caudal oropharynx/throat area (possibly from repeat tubing?) so would like to keep bottle feeding as a back up option in case tubing needs to be abandoned. Toa is currently showing no signs of discomfort or distress during tubing, tolerates it very well. We can check this when we are next on site as well, but in the meantime if HUHA vets can keep a close eye on that please
- We are going to continue upping the ratio of formula to vytrate, so please see the attached feeding schedule for 18/07/21 – there is no hard copy of this, I'm sorry. Had not gotten it printed off before the food was collected this afternoon. At this rate he should be on 100% formula from Monday afternoon, and we can look at making the formula richer or increasing volume if we need to increase caloric intake.
- We will organise a day early next week to revisit Toa to take a repeat blood sample
- I am going to be off for the next two days, but [REDACTED] is here tomorrow and [REDACTED] and [REDACTED] will both be here on Monday

Thanks again (and again and again) for everyone's hard work and dedication especially in the horrible conditions today.

[Me tiaki, kia ora!](#)

[REDACTED] BVSc (Hons)
Veterinarian | Animal Care and Science | Wellington Zoo Trust
200 Daniell Street | Newtown | Wellington 6021
Ph + [REDACTED]
E [REDACTED]@wellingtonzoo.com | W www.wellingtonzoo.com |

New Adventure Ads - Email Signature - Giraffe



[REDACTED]
[REDACTED]
[REDACTED]

Feed Schedule for 18/7/21

8 AM	10 AM	12 PM	2 PM	4 PM	6 PM	Totals
1L formula	1L formula	1L formula	1.5 L formula	1.5 L formula	1.5 L formula	7.5 liters formula
1.2 L 50% vytrate	1.2 L 50% vytrate	1.2 L 50% vytrate	700ml 50% vytrate	700ml 50% vytrate	700ml 50% vytrate	5.7 liters 50% vytrate
2.2 liter total volume	13.2 liter total daily volume					

If continued cramping/discomfort seen after any of these feeds please notify Wellington Zoo Vet Team. If regurgitation ever seen, stop tubing and notify vet team.

18 July 2021

From: [REDACTED]
To: [REDACTED]; [Ian Angus](#);
[Marine](#);
Cc: [HUHA Helping You Help Animals](#); [ingrid](#) [REDACTED]
Subject: Veterinary update for orca calf 18/07/21
Date: Sunday, 18 July 2021 5:55:26 pm
Attachments: [image001.png](#)

Hi everyone,

A veterinary update on Toa for today. Team HUHA and Whale Rescue please feel free to add to my updates if I've missed anything from our conversations or if you otherwise have anything to add!

Firstly thank you so much to everyone who worked so hard in such awful weather in the last couple of days, I thought of you often and I hope you managed to stay warm and dry in between caring for Toa.

1. Current medical findings

Lab tests:

- The lab has unfortunately said that it can't run lactate on the type of sample that we've given them, but we can run it on the next sample we take using a patient-side machine that we can bring with us on the next blood sampling.
- We are still awaiting blow hole swab culture (fungal and bacterial) results from samples taken Monday 12/07/21.
- The team on-site have collected a faecal sample – thank you! Will chat tomorrow about how we get that where it needs to be for analysis.
- A urine sample was collected and tested today:
 - USG today was 1.028, and there was +1 protein and +1 glucose on the urine dipstick. In some animals those dipstick findings can be abnormal, but we'll wait to see if they persist (in some species they can be normal, or at least explained by physiology rather than disease).

Physical exam:

- There are still superficial and deeper abrasions to the underside of the tail flukes and the underside of the chin. There are also several deep lacerations near his tail fluke laterally to his spine.
- His right eye has started to be a bit squinty. There is no discharge or swelling or other abnormalities associated with it. The vet on-site will perform some tests to see whether there might be an abrasion to the surface of the eye or any other abnormalities.
- There is a small ulcer or skin wound next to his blowhole – the vet on-site is planning on taking some samples from that.
- Due to the size of the animal and the limitations of our diagnostic testing, it is still possible that there is a disease condition present that predisposed him to being separated from his pod and that we have not been able to detect.

2. Proposed medical/nutrition plan moving forward

His current medical care consists of:

Ongoing recording of respiratory rate, and also any observed defaecation and urination.

- Respiratory rate is being recorded by whale rescue volunteers (thank you!).
- He has been observed to defaecate every day at this stage. No significant abnormalities/changes of defaecation have been noted with introducing or increasing the diet.
- He has been observed to urinate in the last 24 hours.

-

Fluids/feeding:

- We use the following two calculations to plan his food and fluid requirements for the day.
 - His daily fluid requirements are estimated to be 40-80ml/kg/d (= 8-16L per day).
 - His daily caloric requirements are 120-125kcal/kg/d.
- Ultimately we would like him on just formula (no supplementary fluid), as this contains enough fluid to also meet his fluid requirements, but we've been advised to build up to that slowly, which is why his diet is changing a little every day at the moment.
- Today the feeding plan was 1L formula + 1.2L 50% vytrate for the first three feeds (2.2L total) and then 1.5L formula + 0.7L 50% vytrate for the second three feeds (2.2L total). (Total of 7.5L formula and 5.7L 50% vytrate for today).
 - HUHA team if you could fill us in on how you went with this that would be lovely :)
- **Tomorrow's feeding plan:**
 - **1.1L formula + 0.4L 50% vytrate per feed x 8 feeds at 2 hourly intervals (total of 8.8L formula and 3.2L 50% vytrate).**
- We've had to make a few changes to his feed schedule to get to the feeding plan for tomorrow:
 - He has been showing signs of discomfort after tube feeding – sinking to the bottom of the pool and hunching slightly.
 - This may be due to discomfort due to the volume fed - hence smaller meals tomorrow – fed more frequently so that we still try to meet his requirements.
 - Or it may be due to discomfort from the tubing. The cetacean vets that we've been taking advice from say that bottle feeding him would be a good alternative. They say it may contribute to habituation, but that so does being near to humans and being handled for tubings/treatments etc, so they are not concerned about the bottle feeding on its own per-se.
 - A bottle set up has been trialled today with moderate success. The signs of discomfort that were seen post-tubing have not been seen after bottle feeding.
- A few pointers from the cetacean vets:
 - Please make sure he's not gulping air while feeding – this can cause colic and discomfort.
 - They've recommended a de-gas medication be added to the feeds, I will source this asap and let you know when it's ready.
 - Please make sure he's not gulping water while feeding – too much sea water ingestion can affect his electrolyte levels and make him sick.
 - We/you can consider supplement feeding him with tube feeding if some of his bottle feeds are less productive than others.
 - They prefer him to have a break from feeding overnight to allow him to rest, so they do not advise feeding constantly over a 24 hour period at this stage.
- An important piece of information that I received today is that orca abdomens do not expand very easily compared to other mammals. As a result, a build up of anything in the abdomen increases the pressure in the abdomen rather than causing abdominal distension. So a build up of gas can very quickly become uncomfortable, as can ingesting volumes that are too large – so perhaps this is the reason we're seeing some discomfort after tubing.
- Please continue to monitor him for signs of gut upsets: regurgitation, vomiting, signs of abdominal pain, bloating, increased frequency of defaecation and/or diarrhoea.

Today it was noted that some of the volunteers were encouraging him to suck on their thumbs as they thought this might help with feeding. Thank you Whale Rescue and HUHA for realising this was happening and for advising them to stop :)

Due to the suspected/confirmed (?) sewage spill at Plimmerton due to the horrible weather this weekend the team recently changed his pool from salt water to chlorinated water. Please could we change this to fresh water or back to sea water if the Plimmerton sea water is okay again? It was a good idea to change from sea water when the sewage problem was reported, but fresh water is much better for him than chlorinated water, which could negatively affect his skin and eyes.

Additional medications:

- Antibiotics (enrofloxacin 5mg/kg) by intramuscular injection twice a day starting on the morning of 14/07/21 will be continued until 20/07/21 inclusive.

Plan for regular monitoring:

- We're still putting together some monitoring parameters which will help us assess his health and welfare on a daily-weekly basis. Will keep you updated as this develops, it will likely involve semi-regular blood samples if possible (1-2x per week), respiratory rates, girth/length measurements, weight (if possible), bowel movements, observations/videos of movement/behaviour etc – so similar to what we're already doing.

19 July 2021

From: [REDACTED]
To: [HUHA Helping You Help Animals](#)
Cc: [REDACTED]; [Ian Angus](#); [Marine](#); [REDACTED]; [Ingrid](#); [REDACTED]
Subject: RE: Veterinary update for orca calf 18/07/21
Date: Monday, 19 July 2021 5:33:07 pm
Attachments: [image003.jpg](#)
[image004.jpg](#)

Hi everyone,

A shorter veterinary update on Toa from me today :)

As usual, Team HUHA and Whale Rescue please feel free to add to these updates!

1. Current medical findings

Lab tests:

- We are still awaiting blow hole swab culture (fungal and bacterial) results from samples taken Monday 12/07/21.
- The team on-site have collected a faecal sample – thank you! Can take that from you tomorrow when we pop by to send it on to the lab.
- A urine sample was collected and tested today:
 - USG today was 1.018, and there was trace protein and no glucose on the urine dipstick. These findings are of no concern and we'll continue regular urine monitoring to look for any trends.

Physical exam:

- There are still superficial and deeper abrasions to the underside of the tail flukes and the underside of the chin. There are also several deep lacerations near his tail fluke laterally to his spine.
- His right eye has started to be a bit squinty. There is no discharge or swelling or other abnormalities associated with it. The vet on-site will perform some tests to see whether there might be an abrasion to the surface of the eye or any other abnormalities.
- There is a small ulcer or skin wound next to his blowhole – the vet on-site is planning on taking some samples from that.
- Due to the size of the animal and the limitations of our diagnostic testing, it is still possible that there is a disease condition present that predisposed him to being separated from his pod and that we have not been able to detect.

2. Proposed medical/nutrition plan moving forward

His current medical care consists of:

Ongoing recording of respiratory rate, defaecation and urination.

-

Fluids/feeding:

- We use the following two calculations to plan his food and fluid requirements for the day.
 - His daily fluid requirements are estimated to be 40-80ml/kg/d (= 8-16L per day).
 - His daily caloric requirements are 120-125kcal/kg/d.
- As of tomorrow he can receive 100% formula (no additional vytrate). According to his requirements of 120-125kcal/kg/d, an estimated weight of 200kg and an estimated caloric content of the food of 1450kcal/L, he requires 16L of formula per day to meet his requirements. This could be divided into several feeds such as 10 x 1.6L feeds or 8 x 2L feeds over the day tomorrow – would that suit how he's currently feeding?
 - If he receives this volume, this should also meet his fluid requirements for the day.

A few quick questions please, as I didn't manage to get anyone on the phone today:

How was his respiration/defaecation/urination today?

- How much volume did you get into him today formula-wise and vytrate-wise? Was this mostly by bottle or did you tube feed him again today?
- Did you see any signs of post-feed discomfort today?
- Did you see any other signs of gut upset? ie: regurgitation, vomiting, signs of abdominal pain, bloating, increased frequency of defaecation and/or diarrhoea.

Additional medications:

- Antibiotics (enrofloxacin 5mg/kg) by intramuscular injection twice a day starting on the morning of 14/07/21 will be continued until 20/07/21 inclusive.
- We've started him on the oral de-gas medication (simethicone) today (19/07/21) that has been recommended by a few vets that have been involved in hand rearing of cetaceans to help prevent problems from air that is gulped during feeding.

Plan for regular monitoring:

- We're still putting together some monitoring parameters which will help us assess his health and welfare on a daily-weekly basis. Will keep you updated as this develops, it will likely involve semi-regular blood samples if possible (1-2x per week), respiratory rates, girth/length measurements, weight (if possible), bowel movements, observations/videos of movement/behaviour etc – so similar to what we're already doing.

A few of us from the zoo will pop by tomorrow to:

- Take some repeat bloods.
- Catch up with you about some of the physical exam findings, check in with how feeding is going, check in on a couple of monitoring parameters etc. If you'd like us to bring/check anything specific let me know!
- Bring gear/recipes/instructions to hand over the formula prep.

3. Advice regarding management of disease between orca calf and humans, in both directions.

This advice remains the same as at the last update.

4. Other work in progress

Wetsuit hygiene/biosecurity instructions are still a work in progress

Thanks so much everyone for all your time and expertise. If you have any questions or comments please don't hesitate to get in touch.

Kind regards,

[REDACTED]

[REDACTED] BVSc, MVSc (Zoo Animal and Wildlife Health), MANZCVS (Avian Health)

Senior Veterinarian | Animal Care and Science | Wellington Zoo Trust

200 Daniell Street | Newtown | Wellington 6021

Ph [REDACTED]

E [REDACTED]@wellingtonzoo.com | W www.wellingtonzoo.com |

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

20 July 2021

From: [REDACTED]
To: [HUHA Helping You Help Animals](#)
Cc: [REDACTED]; [Ian Angus](#); [Marine](#); [REDACTED]; [Ingrid](#); [REDACTED]
Subject: Veterinary update for orca calf 20/07/21
Date: Tuesday, 20 July 2021 7:16:52 pm
Attachments: [image001.jpg](#)
[image002.jpg](#)

Hi everyone,

A veterinary update on Toa from today. Please add anything I may have missed.

1. Current medical findings

Lab tests:

- We are still awaiting blow hole swab culture (fungal and bacterial) results from samples taken Monday 12/07/21.
- The team on-site have collected several faecal samples and these have been submitted for testing for parasitology, gram stain, salmonella culture and occult blood. We will let you know what these results show when we get them.
- A urine sample was collected and tested today:
 - USG today was 1.016 – despite some feeding difficulties in the last 24 hours, it looks like he is not currently dehydrated. We'll continue regular urine monitoring to look for any trends.
- One of our techs performed some water testing today. I will get the full numbers from her for this tomorrow, but I can give you interim findings in the meantime:
 - The chlorine level in the water is negligible. I think there was a misunderstanding here on my part I'm sorry, when I was told that he was in "chlorinated water", I thought you meant "swimming pool level chlorination", which would have been concerning. The level of chlorine in town supply water is much lower and should be fine in the interim if sea water is not available. Thank you for clarifying this today.
- We were not able to get much blood at all today, despite a few attempts. A drop of blood has been made into a blood smear to repeat an estimated white cell count, if the lab deems the size of this sample suitable.
 - We will return on Thursday to try to take some more blood for routine monitoring of his general condition.

Physical exam:

- Wounds:
 - The abrasions to the underside of the tail flukes and the underside of the chin, and the deep lacerations near his tail fluke laterally to his spine are healing well.
 - The very outer edges of his pectoral flippers and the outer edge of his right tail fluke have some areas of full thickness skin wounds. These do not show any sign of infection (no swelling, discharge etc) but we have taken some photos today to allow us to monitor them over time.
- His right eye is being held shut more than his left and there is mild swelling of the eyelids of the right eye. It is possible that this started around the time of his move to the pool, as his eyes appeared normal before then. One of the cetacean vets we have been talking with thinks this is of minimal concern, but an ophthalmologist that has been contacted would like us to double check a couple of things to make sure it is not of concern. The swelling has reduced somewhat in the last couple of days. He would not let us examine the eye itself today, he held his eyelids tightly shut when we tried to have a look. We'll get in touch with some veterinary ophthalmologists in the lower north island and see what their availability is for a second opinion, and in the meantime we will keep monitoring for improvement of the swelling.
 - Some clear mucous from the eye will be sent to the lab for cytology and culture (although worth noting that normal eye secretions from this species are clear and mucousy).
- There is a small blister on the skin near his blowhole, approximately 1cm in diameter. It contains apparently clear fluid and otherwise there is no inflammation surrounding it. It is the only such lesion that we could see on his skin today. As a result, we are not immediately concerned by this

21 July 2021

From: [REDACTED]
To: [HUHA Helping You Help Animals](#); [REDACTED];
[Ian Angus](#); [Marine](#); [REDACTED];
[Ingrid](#); [REDACTED]
Subject: Veterinary update for orca calf 21/07/21
Date: Wednesday, 21 July 2021 5:52:33 pm
Attachments: [image004.jpg](#)
[image005.jpg](#)
[image001.png](#)

Hi everyone,

A veterinary update on Toa from today.

1. Current medical findings

Lab tests:

- A blowhole culture taken 12/07/21 grew a light growth of E.coli and no fungi. This is of no clinical concern given the light growth and no signs of respiratory disease. It is likely that we'll repeat blowhole cultures throughout his time in care to monitor for trends.
- We are awaiting faecal results from samples submitted to the lab today: for parasitology, gram stain, salmonella culture and occult blood.
- A urine sample was collected and tested today:
 - USG today was 1.014. Some reference ranges for urine testing have been circulated amongst the vet teams (thanks [REDACTED]!) which indicate that our urine testing results so far are normal for this species.
- Blood was taken today by the HUHA team (thank you!):
 - In house biochem: Generally of no concern. His blood urea nitrogen (BUN) has increased slightly above normal, but this is likely to do with having recently eaten a protein rich meal (= formula). This analyte also increases with kidney disease/dehydration, but all our other blood and urine tests indicate that he is well hydrated and his kidneys are functioning normally. There are some other minor deviations from normal which are of no clinical significance at this stage but which we will monitor the trends of over time.
 - CBC: will be sent to the lab tomorrow
 - Serum electrophoresis: will be sent to the lab tomorrow
 - Cholesterol/triglycerides: will be sent to the lab tomorrow
 - Some historical blood has been stored in our -80°C freezer.
- We are awaiting cytology and culture on eye discharge submitted to the lab today.

Physical exam:

- Wounds:
 - The abrasions to the underside of the tail flukes and the underside of the chin, and the deep lacerations near his tail fluke laterally to his spine are healing well.
 - The very outer edges of his pectoral flippers and the outer edge of his right tail fluke have some areas of full thickness skin wounds. These do not show any sign of infection (no swelling, discharge etc). These are being monitored.
 - A small blister on the skin near his blowhole (~1cm diameter) is being monitored.
- His right eye is being held shut more than his left and there is mild swelling of the eyelids of the right eye. These changes are still present but appear reduced in severity today. We have contacted some local veterinary ophthalmologists and are waiting to see if they are able to come examine the eye and what their availability is.
- Girth measurement update:
 - On 16/07/21: length 2.12m, girth in front of dorsal fin 1.42m, girth behind dorsal fin 1.17m
 - On 20/07/21: girth at widest point in front of dorsal fin 1.42m, girth at widest point behind dorsal fin 1.17m, girth at pectoral fin insert 1.34m
 - Girth measurements have some limitations in their use to assess body condition, but these results indicate no immediate significant weight loss. We will continue to monitor this over time to assess his response to feeding and the success of feeding.
- There is some minor swelling at the sites where injections were previously administered. He is not currently receiving injectable medications and these sites will be monitored.

2. Proposed medical/nutrition plan moving forward

His current medical care consists of:

Ongoing recording of respiratory rate, defaecation (regular today) and urination (observed today).

Fluids/feeding:

- We use the following two calculations to plan his food and fluid requirements for the day.
 - His daily fluid requirements are estimated to be 40-80ml/kg/d (= 8-16L per day).
 - His daily caloric requirements are 120-125kcal/kg/d.
- Today the plan is to feed him 10x feeds of 50:50 formula to 50% vytrate at 1.5 hour-intervals. No colic or other signs of gut disease have been observed since overnight on Monday night/very early Tuesday morning.
 - This is a step back on our diet increases, with a plan to slowly increase again in future when his gut settles so that we can aim to meet his caloric requirements.
- We will see how we go on this feeding plan for the rest of today and will be in touch in the morning to see how you went and what our plan will be for 22/07/21.
- Please do not offer him any solid food yet. This needs to be introduced very carefully, and only once he's old enough and once the formula feeding is stable and reliable or this could cause quite significant gut upsets.

Additional medications:

- Oral de-gas medication (simethicone) is ongoing since 19/07/21 to help prevent problems from air that is gulped during feeding.

Plan for regular monitoring:

- We're still putting together some monitoring parameters which will help us assess his health and welfare on a daily-weekly basis. Will keep you updated as this develops, it will likely involve semi-regular blood samples if possible (1-2x per week), respiratory rates, girth/length measurements, weight (if possible), bowel movements, observations/videos of movement/behaviour etc – so similar to what we're already doing/communicating.

He is still in the pool, but as of today (21/07/21) he is back in sea water.

Thanks so much everyone for all your ongoing time and expertise. If you have any questions or comments please don't hesitate to get in touch.

Kind regards,

██████████

██████████ ██████████, MVMSc (Zoo Animal and Wildlife Health), MANZCVS (Avian Health)
Senior Veterinarian | Animal Care and Science | Wellington Zoo Trust
200 Daniell Street | Newtown | Wellington 6021
Ph ██████████
E ██████████@wellingtonzoo.com | W www.wellingtonzoo.com |

[New Adventure Ads - Email Signature - Caracal](#)



██████████ ██████████

22 July 2021

From: [REDACTED]
To: [HUHA Helping You Help Animals](#); [REDACTED]; [Ian Angus](#); [Marine](#); [REDACTED]; [REDACTED]
Subject: Veterinary update for orca calf 22/07/21
Date: Thursday, 22 July 2021 6:29:21 pm
Attachments: [image006.png](#)
[image007.jpg](#)
[image008.jpg](#)
[image001.png](#)
[Toa blood - urine - measurements results.xlsx](#)

Hi everyone,

A veterinary update on Toa from today.

1. Current medical findings

Lab tests:

- Faecal results from samples submitted to the lab yesterday:
 - No nematodes or trematodes were detected (two types of worm parasite).
 - Giardia was not detected.
 - We are still awaiting a gram stain, salmonella culture and occult blood test.
- Blood samples taken by the HUHA team and submitted to the lab today (thank you!):
 - CBC/fibrinogen: pending.
 - Serum electrophoresis: pending.
 - Cholesterol/triglycerides: pending.
- Eye discharge submitted to the lab yesterday from the right eye:
 - Cytology: normal (no signs of inflammation/infection)
 - Culture: pending.

Physical exam:

- Wounds:
 - The abrasions to the underside of the tail flukes and the underside of the chin, and the deep lacerations near his tail fluke laterally to his spine are healing well.
 - The very outer edges of his pectoral flippers and the outer edge of his right tail fluke have some areas of full thickness skin wounds. They do not show any sign of infection (no swelling, discharge etc) and are being closely monitored. These appear to be getting worse with time in the pool so may indicate rub/wear injuries from repeatedly contacting/rubbing the edge of the pool as he swims. He will be trialled in the sea pen again to see if this reduces this rubbing and allows these wounds to heal.
 - Volunteers in the water aim to reduce his contact with the walls/floor of whatever space he's in.
 - A small blister on the skin near his blowhole (~1cm diameter) is being monitored.
- His right eye is being held shut more than his left and there is mild swelling of the eyelids of the right eye. These changes are still present but appear reducing in severity. We have contacted some local veterinary ophthalmologists and are waiting to see if they are able to come examine the eye and what their availability is.
- There is some minor swelling at the sites where injections were previously administered. He is not currently receiving injectable medications and these sites will be monitored.

2. Proposed medical/nutrition plan moving forward

His current medical care consists of:

Ongoing recording of respiratory rate, defaecation (was this observed today?) and urination (was this observed today?).

-
Fluids/feeding:

- We use the following three calculations to plan his food and fluid requirements for the day.
 - His daily fluid requirements are estimated to be 40-80ml/kg/d (= 8-16L per day).

- His daily caloric requirements are 120-125kcal/kg/d.
- The hand rearing formula that we are feeding is calculated to contain 1450kcal/L.
- He has had some difficulties feeding in the last 24 hours, with seemingly some distaste for the taste of the formula and has been spitting out the bottle teat on some occasions. Team HUHA how did you get on with feeds today, what sort of volumes of what kind of formulas did you get into him? Did you end up stomach tubing any of the feeds?
- Tomorrow we've organised an online meeting with an overseas vet with experience in hand rearing cetaceans to help us trouble shoot this and provide some advice on a feeding/formula plan moving forward and tips on tweaking feeding on a feed-by-feed and day-by-day basis.
- Please do not offer him any solid food yet. This needs to be introduced very carefully, and only once he's old enough and once the formula feeding is stable and reliable or this could cause quite significant gut upsets.

Additional medications:

- Oral de-gas medication (simethicone) is ongoing since 19/07/21 to help prevent problems from air that is gulped during feeding.
 - Please let us know when you are running low and we'll get you some more.

Plan for regular monitoring of health and welfare:

- [REDACTED] and I have put together the bare bones of a spreadsheet with some of the data that we've had available to our teams so far, and I've attached it here.
 - Blood results, some girths/measurements, some urine results, some feeding/defaecation data.
- I don't have all the data for urination, defecation, respiration rates, girths/measurements, or volumes/frequencies fed, which might be useful to include in such a spreadsheet to help with health and welfare assessment on a day-to-day basis, and also to help monitor trends.
 - Would it be possible to combine that data with this spreadsheet please?
- Is there interest in making such a spreadsheet a document that can be edited by a few people so that such data can be centralised? And if so, is someone more tech-savvy than myself able to coordinate that please?

I believe he may have been moved back to the sea pen this afternoon, conditions/equipment/personnel permitting.

Thanks so much everyone for all your ongoing time and expertise. If you have any questions or comments please don't hesitate to get in touch.

Kind regards,

[REDACTED]

[REDACTED] BVSc, MVSc (Zoo Animal and Wildlife Health), MANZCVS (Avian Health)

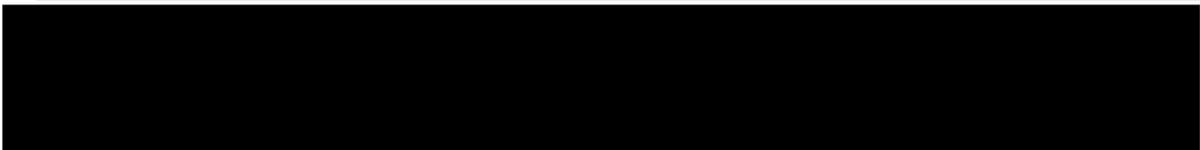
Senior Veterinarian | Animal Care and Science | Wellington Zoo Trust

200 Daniell Street | Newtown | Wellington 6021

Ph [REDACTED]

E [REDACTED]@wellingtonzoo.com | W www.wellingtonzoo.com |

[New Adventure Ads - Email Signature - Caracal](#)



Lab testing location		11/07/2021	12/07/2021	12/07/2021	14/07/2021	21/07/2021	Reference Ranges (SI Units)
		In house lab		External lab	In house lab		
Haematology	RBC			3.42			3.59-3.77
	HGB			134.00			141.9-146.9
	HCT	0.29		0.39	0.35	0.35	40.76-42.13
	MCV			113.00			111.31-114.48
	MCH			39.00			38.77-39.99
	MCHC			345.00			345.3-351.9
	WBC	4.06		7.10			6.032-6.851
	MONO	0.12		0.20			no reference
	MONO %	3		3.00			no reference
	LYMPH	0.73		0.90			no reference
	LYMPH%	18		13.00			no reference
	NEUT	3.2		5.90			no reference
	NEUT %	79		83.00			no reference
	BAND			0.10			no reference
	BAND %			1.00			no reference
	THROMB		Adequate				no reference
	FIB			2.00			2.48-2.82
	ALB	53		36	50	33	33.9-36.1
	ALP	777		878	652	490	673.1-746.6
	ALT			19		40	15.62-21.71
AST	85			95	234	48-55.18	
Ca	2.52		2.77	2.53	2.49	2.22-2.27	
GGT	12			14	12	6.01-10.5	
TP	61		61	58	54	55.4-60.5	
GLOB	9		25	8	23	21-25	
BUN	11.7		12.8	13.5	19.7	12.42-14.13	
CK	478			250	288	225.2-253.6	
Phos	2.86		3	2.4	1.39	2.06-2.19	
Mg	0.97			0.78	0.91	no reference	
GLU			7.4	6.5	4.9	6.6-7.0	
Amyl			<5		<5	no reference	
Tot. Bil			5		2	1.54-1.88	
CRE			95		39	71.6-89.28	
Na			153		144	155-156.4	
K			6.9		5.1	4.01-4.11	
Iron			10			5.4-25.1	

	11/07/2021	12/07/2021	13/07/2021	14/07/2021	15/07/2021	16/07/2021	17/07/2021	18/07/2021	19/07/2021	20/07/2021	21/07/2021	22/07/2021	23/07/2021
Urination general					Observed	Observed	Observed	Observed	Observed	Observed	Observed		
USG:					1.010	1.017	1.028	1.018	1.016	1.014			
Urine pH					5	not recorded		5	not recorded	not recorded		5	
Urine protein					not recorded	not recorded	1+	-		not recorded	-		
Urine glucose					not recorded	not recorded	1+	-		not recorded	-		
Urine rest of dipstick					not recorded	not recorded	NAD	NAD		not recorded	NAD		

	11/07/2021	12/07/2021	13/07/2021	14/07/2021	15/07/2021	16/07/2021	17/07/2021	18/07/2021	19/07/2021	20/07/2021	21/07/2021	22/07/2021	23/07/2021
Defaecation		Recorded 5x	Recorded at 9am (any more?)						Did not pass faeces all day until 1am on morning of 20/07/21				
Colic							Colic noticed immediately after some tube feedings in evening						
Feeding notes	NPO fluids/food	1L oral fluids via tube 6pm	Oral fluids 2L 8am, 2L 1pm, 3L 2x in afternoon/eve	Start formula	Formula	Formula	Formula	Formula	Colic at 8pm Formula	Colic at 1am Formula	Formula	Formula	