

**A Decision by the  
Deputy Health and Disability Commissioner  
(Case 22HDC00236)**

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## **Introduction**

1. This is the opinion of Rose Wall, Deputy Health and Disability Commissioner, and is made in accordance with the power delegated to her by the Commissioner.
2. The report discusses the care provided to Baby A at Auckland City Hospital (Health New Zealand|Te Whatu Ora (Health NZ) Te Toka Tumai Auckland)<sup>1</sup> in 2020, with specific focus on his neurological examination, assessment, and monitoring in the first hours of his life.
3. Baby A was born in poor condition. He required resuscitation and was transferred to the Neonatal Intensive Care Unit (NICU). At 10.5 hours of age Baby A was assessed as having mild (stage 1) hypoxic ischaemic encephalopathy (HIE), with some features of moderate (stage 2) HIE. Hypoxic ischaemic encephalopathy is ‘a clinically defined syndrome of disturbed neurological function in the earliest days of life in the term infant, manifested by difficulty with initiating and maintaining respiration, depression of tone and reflexes, sub normal level of consciousness and often seizures’. Therapeutic hypothermia (cooling) is recognised as an effective intervention to decrease adverse neuro-developmental outcomes following HIE.

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<sup>1</sup> On 1 July 2022, the Pae Ora (Healthy Futures) Act 2022 came into force, which disestablished all district health boards. Their functions and liabilities were merged into Health New Zealand|Te Whatu Ora. Auckland District Health Board (ADHB) is now known as Health New Zealand|Te Whatu Ora Te Toka Tumai Auckland.

4. Subsequently, Baby A was diagnosed with cerebral palsy. Health NZ told HDC that the underlying cause of Baby A's cerebral palsy is continuing to be investigated.
5. After receiving a report from an Accident Compensation Corporation (ACC) external assessor, Baby A's mother made a complaint to HDC about the care provided to Baby A, specifically that there had been a failure to assess Baby A properly and subsequently treat him for HIE with therapeutic hypothermia. Mrs A sought outcomes of improved systems and processes, and an apology to be made for any failings.
6. The following issue was identified for investigation:
  - *Whether Health New Zealand/Te Whatu Ora Te Toka Tumai Auckland provided Baby A with an appropriate standard of care in 2020.*
7. Subsequent to the initial notification, a further issue was identified and has been investigated:
  - *Whether Dr B provided Baby A with an appropriate standard of care in 2020.*
8. The parties directly involved in the investigation were:

Mrs A	Complainant/mother
Health NZ Te Toka Tumai Auckland	District healthcare provider
Dr B	Junior paediatric registrar/provider
Dr C	Neonatal paediatrician/provider
9. Further information was received from ACC.

### Responses to provisional opinion

10. Mrs A was provided with the opportunity to comment on the 'Information gathered during investigation' section of this report. No comments were received.
11. Dr B and Health NZ were given the opportunity to comment on the provisional report. Responses have been included where relevant.

### My decision

12. After review of all the available information, my opinion is as follows:
  - The doctor in charge of Baby A's care in NICU (Dr B) completed, but did not record, Baby A's initial neurological examination. I have made adverse comment and a recommendation regarding this.
  - Health NZ Te Toka Tumai Auckland breached Right 4(2) of the Code of Health and Disability Services Consumers' Rights (the Code) for the following reasons:
    - Dr B was not provided with neonatal encephalopathy training in a timely manner;
    - The NICU orientation booklet did not include information about neonatal encephalopathy or refer to specific guidelines to guide practice; and

- There were no internal policies and procedures in place to ensure that babies at high risk of HIE were managed and monitored using serial Sarnat scoring, in accordance with national guidance on neonatal encephalopathy at the time.
13. I have made several recommendations in relation to this.
14. The relevant background and reasons for my decision are set out in the remainder of this report.

## Background

### Birth

15. Baby A was born at full-term gestation (39+3 weeks) at Auckland City Hospital. His birth was forceps-assisted following a period of fetal distress in labour (20 minutes of fetal bradycardia<sup>2</sup> and heavily meconium-stained amniotic fluid<sup>3</sup> present following artificial rupture of membranes). Following the birth, a true knot<sup>4</sup> was identified in the umbilical cord.
16. At birth, Baby A was floppy (hypotonic) with an abnormally low heart rate and no breathing effort. He required resuscitation, including intermittent positive pressure ventilation for 15 minutes. His first gasp was taken at 2 minutes 45 seconds, with normal oxygen saturations at eight minutes and regular breathing established at 17 minutes (although he was noted to be grunting). Baby A's Apgar scores<sup>5</sup> were 2 at one minute and 6 at five minutes (no further scores were recorded). His cord blood gases<sup>6</sup> showed a combined respiratory and metabolic acidosis.<sup>7</sup>

### One day of age

#### *NICU admission*

17. At 12.15am Baby A was admitted to the Neonatal Intensive Care Unit (NICU). He was started on continuous positive airway pressure (CPAP) breathing support for respiratory distress and given antibiotics in light of meconium exposure. Baby A's capillary blood gases showed improvement of acidosis after admission. At one hour of age, Baby A's blood gases indicated moderate metabolic acidosis. At three hours of age, Baby A's blood gases had almost

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<sup>2</sup> Abnormally low heart rate.

<sup>3</sup> Meconium is the first faeces, or stool, of the newborn, and may indicate fetal stress if it is passed prior to birth.

<sup>4</sup> A tight knot in the umbilical cord, which can prevent oxygen and nutrients from reaching the baby.

<sup>5</sup> The Apgar score is a clinical indicator used to evaluate the condition of a newborn after birth (usually at one minute and five minutes after birth). The one-minute score determines how well the baby tolerated the birthing process, and the five-minute score tells the healthcare provider how well the baby is doing outside the mother's womb. The score is based on a rating of 0, 1, or 2 for each of five observed characteristics, with 10 being a perfect score. A score of 7, 8, or 9 is normal and is a sign that the newborn is in good health.

<sup>6</sup> Umbilical cord blood gas samples provide an objective assessment of the metabolic condition of the baby at birth, which can help to detect whether a baby suffered a birth injury during delivery.

<sup>7</sup> An abnormal condition characterised by reduced alkalinity of the blood and of the body tissues. Respiratory acidosis is caused by excessive retention of carbon dioxide.

See <https://www.merriam-webster.com/medical/respiratory%20acidosis>. Metabolic acidosis is the result of excess acid due to abnormal metabolism, excessive acid intake, or renal retention or from excessive loss of bicarbonate (as in diarrhoea). See: <https://www.merriam-webster.com/medical/metabolic%20acidosis>

normalised, although his lactate was slightly elevated at 3.9. A chest X-ray taken four hours after birth was consistent with the cause of Baby A's respiratory distress being meconium exposure, infection, or delayed fetal lung fluid clearance.

### *Neurological assessment*

18. Paediatric neonatologist Dr C at Auckland City Hospital told HDC:

'It is standard of care for all babies admitted to the NICU to have a full examination, including a neurological examination [assessing tone and activity, Moro reflex<sup>8</sup> and grasp reflex], which is documented on the newborn record on admission. In addition, babies at risk of HIE, as [Baby A] was (acidotic cord blood gases, low Apgar scores and requiring prolonged resuscitation), should have early and repeated neurological assessments to determine if they fulfil the criteria for therapeutic hypothermia. There is no documentation showing [Baby A] had a neurological examination, either on his Newborn Record or in the clinical notes.'

19. Junior paediatric registrar Dr B was working in NICU on the night of Baby A's admission. Dr B attended Baby A's birth and examined him on admission to NICU.
20. Dr B confirmed that the standard clinical examination includes an initial neurological assessment to determine whether further neurological assessment is indicated, including assessment of tone and activity, Moro reflex, and grasp reflex. Dr B stated that ordinarily this would be done routinely as part of the checklist in the Newborn Record.
21. The Newborn Record checklist lists various clinical examinations that should be completed upon a baby's admission to NICU. The checklist has boxes to either 'tick' if results are normal, 'cross' if results are abnormal, or leave blank if the examination has not been done. Dr C told HDC that it is standard for these tick boxes to be marked as either normal or abnormal for all admissions to NICU.
22. Baby A's Newborn Record documents a partial newborn examination. Most of the boxes in the checklist have been ticked (18 out of 22). The box for 'tone and activity' contains a mark that is neither a tick nor a cross, and the boxes for 'Moro reflex', 'grasp reflex', and 'hip joint' have been left blank. There is no documentation of a neurological assessment in Dr B's NICU admission note.
23. Dr B cannot recall whether a neurological assessment was completed at the time of Baby A's NICU admission. Dr B stated:

'I have no reason to believe that I did not follow my usual practice in this case, however I did not tick these boxes on the checklist to confirm that these checks were done. I am unsure why this documentation was incomplete, but it may have been as the result of a busy night shift, I may have gone back to re-examine, I may have been asked to do another task and not returned to it, or someone else may have had the card to fill in

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<sup>8</sup> The Moro reflex (also called the 'startle reflex') is a normal reflex for a newborn infant when it is startled or feels as if it is falling.

other parts. I cannot clearly recall and was not asked to clarify until over four months later.'

24. Dr B stated that some of the neurological checks would also likely have been performed as part of the management of other procedures done on Baby A, such as tone, activity, and possibly grasp during intravenous line insertion. Dr B is unsure why this was not documented. In response to the provisional report, Dr B told HDC that usual practice was to comment if an examination was not done (rather than leave it blank). Dr B also provided further information regarding the newborn neurological testing process and how it was applied to Baby A's circumstances.

#### Tone and reflex activity/grimace

25. Dr B told HDC that Baby A's tone and reflex were assessed as part of the Apgar tests conducted at 1 and 5 minutes of age, as recorded on the newborn record.

26. Dr B also noted:

'The rest of the newborn examination would have required head to toe, front and back examination, including turning the baby over to examine the spine. It would not be possible to do this without examining tone and activity. Any issues with tone and activity would have been picked up at this time.'

27. Dr B stated that if any abnormalities had been observed, these would have been recorded.

#### Grasp reflex

28. Dr B highlighted that Baby A had an IV inserted into his hand. Dr B told HDC that Baby A's grasp reflex would have been assessed during the IV insertion, as Baby A's hand had to be picked up and the back of it assessed for suitable veins. Dr B stated that if any abnormalities had been observed, these would have been recorded.

#### Moro reflex

29. Dr B advised that this examination was part of the usual process for examining newborns, there is no reason to believe that it was not performed.

30. In relation to why the neurological parts of the newborn assessment were not marked as having been completed, Dr B stated:

'I do not believe lactate results from cord gases were available at the time of delivery but have been completed by the midwife on the [newborn record]. This suggests to me that the documentation likely stayed with the midwife in the delivery suite for their completion while I went to NICU with the baby for ongoing management. This [newborn record] would then have been returned at a later time. It is likely I did not return to complete this later, whilst being busy with other deliveries and no further concerns being flagged ...

Many handovers and plans made that occurred in NICU were verbal, and not documented. The morning handovers occurred without the notes, so documentation

was not possible in real time. No concerns were raised by [Dr C] at the time [Baby A] was admitted regarding incomplete documentation. If a concern had been raised, I would have been able to comment on this at the time or complete the documentation.'

31. In response to the provisional opinion, Health NZ acknowledged that a neurological examination for Baby A was not documented at the time of his NICU admission, and the ongoing assessment (Sarnat scoring) was lacking over the first six hours after birth. However, Health NZ stated:

'[H]e had established regular respiration on [continuous positive airway pressure] and supplemental oxygen, and he had a normal heart rate and blood pressure on admission to the neonatal unit. He was physiologically stable as documented on his NICU observation chart after admission. Hourly Sarnat scoring was required to establish the severity of his hypoxic ischaemic encephalopathy and if this had showed evidence of moderate to severe HIE, therapeutic hypothermia would have been clinically indicated.'

*Contact with on-call consultant*

32. Dr C told HDC that the standard clinical practice at the time of events was that the registrar would examine the baby and, if they had any concerns, they would contact the on-call specialist, who would attend to assess the baby clinically for signs of moderate to severe encephalopathy and make a clinical decision regarding the need for therapeutic hypothermia.

33. Dr B did not contact the on-call consultant to discuss Baby A's birth or condition. Dr B told HDC:

'As a junior registrar I would often seek advice or assistance from a senior registrar or nurse specialist/practitioner before calling the consultant. I believe the senior registrar and I briefly spoke about [Baby A] after his birth. They were aware of the difficult birth as they had been called to attend, and they had reviewed the abnormal blood gases. I do not recall a recommendation from them that this should be escalated to the on call consultant. I do not recall any concerns being raised regarding his neurological status in those first hours or any suggestion from the senior nursing team that a call should be made.'

34. Dr B does not recall the senior registrar suggesting that other assessments or measures should be taken. Dr B stated: 'I feel confident that I would have heeded any advice they provided.'

35. Health NZ provided the following information about the more senior registrar:

'The registrars are allocated different areas in the neonatal intensive care unit, postnatal wards and labour & birthing suite that they are responsible for when on duty overnight. When there is an emergency, both registrars attend. [Baby A] was born with unexpectedly low Apgar scores and [a senior registrar] attended immediately after birth as requested. However, by the time [the senior registrar] arrived, [Baby A] was breathing with support and had a good heart rate so [the senior registrar] left him with

[Dr B]. Although [the senior registrar] was a more experienced registrar who [Dr B] could consult, [the senior registrar] was not responsible for supervising [Dr B].'

36. In response to the provisional report, Dr B told HDC:

'[The senior registrar] "viewed and accepted" the initial blood gas results. This is recorded on the online blood results and is evidence of their involvement and of them taking responsibility for the results.'

37. There is no record of the conversation between Dr B and the senior registrar.

38. The senior registrar no longer works at Auckland Hospital, and HDC has not obtained a statement from the senior registrar about these matters.

39. Dr B stated:

'Transfer and admission to the ward would have involved input from a resource nurse, who is typically senior. A senior clinical charge nurse was present on the ward overnight and would likely have been involved with the admission of [Baby A]. I do not recall any concerns (particularly with regard to neurology) being raised by nursing staff who were caring for [Baby A] during the first six hours of life.'

40. The night shift (7pm–7am) nursing notes do not document any neurological assessment, and no concerns are noted regarding signs of abnormal neurology. At 6am the nursing notes indicate that Baby A appeared 'unsettled'. Dr B recalled being informed by nursing staff at around 7am that Baby A was sore or irritable. Dr B noted that this is when pain scoring was started.

#### *First consultant review*

41. Dr C was the consultant neonatal paediatrician in NICU on the first morning. Dr C received handover from Dr B at 8.30am, including a description of Baby A's cord gases. Dr C asked whether Baby A was showing signs of encephalopathy<sup>9</sup> and Dr B said that he was not.

42. In response to the provisional decision, Dr B told HDC that this statement would not have been made without having performed a neurological examination.

43. Dr C examined Baby A at 9.30am when he was approximately 10.5 hours old. The clinical records document that Baby A was noted to be irritable, with central hypotonia, head lag, hypertonic legs, and '7–8 beats' clonus<sup>10</sup> in the ankles. Baby A's grasp, suck, and gag reflexes were documented to be intact, but his Moro reflex was incomplete.

44. Following examination, Dr C's impression was of mild (stage 1) HIE. Dr C told HDC that on the modified Sarnat scoring system,<sup>11</sup> most of Baby A's examination findings fulfilled the

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<sup>9</sup> Disturbance of brain function.

<sup>10</sup> Involuntary and rhythmic muscle contractions.

<sup>11</sup> The modified Sarnat score is calculated from a list of objective criteria to assess signs of encephalopathy hourly between one and six hours of age.



criteria for mild encephalopathy, with two signs of moderate encephalopathy (central hypotonia and incomplete Moro reflex). Dr C stated:

‘My assessment was that [Baby A] had mild (stage 1) [HIE], based on my findings at 10.5 hours of age. However, as no neurological examination was documented in the first 10 hours after birth it is impossible to know if [Baby A] had showed signs of more severe encephalopathy earlier, which would have fulfilled the criteria for therapeutic hypothermia (cooling).’

45. Dr B stated that when Baby A was seen on the morning ward round, his irritability noted earlier in the morning was considered to be consistent with mild HIE, and this did not change his management.
46. A plan was made to monitor Baby A for clinical seizures, continue his antibiotics, and give him paracetamol as needed, and to request tests for kidney and liver function. Dr C told HDC that it was decided not to request an MRI at that stage as this would not be warranted for mild HIE.
47. Dr B stated that it was not until ‘over four months later’ that the lack of a documented neurological examination was queried or a request made for clarification of Baby A’s neurological status during the first hours of his life.

### **2–6 days of age**

48. Dr C stated that Baby A did well clinically. He had no seizures, and his kidney and liver function tests were normal. Nursing notes document that Baby A was feeding mainly via a nasogastric tube with trials of bottle and breastfeeding. He was noted to be irritable at times, giving a pain score of one, and was administered paracetamol as needed. Baby A’s temperature fluctuated (documented between 36.7 and 37.8 degrees Celsius) and this was thought to be environmental (overwrapping). He was also noted to have rapid breathing at times. At three days of age, Baby A was weaned from respiratory support to breathing unassisted in room air. Baby A’s antibiotics continued until his last dose on Day 5.
49. On Day 3 a NICU Fellow documented that Baby A’s peripheral tone was normal, his truncal tone was mildly low, and his Moro reflex was present. Baby A was documented to be sucking strongly, with knee reflexes ‘not excessively brisk’ and no clonus. He was noted to have displayed around 10 seconds of ‘rhythmic jerking’ in the left arm and leg, which stopped when he was held. There was no associated oxygen desaturation<sup>12</sup> or tachycardia.<sup>13</sup> Nursing notes documented a plan to monitor for ‘jerky movement’.
50. On Day 5 Baby A was reviewed by Dr C. Dr C noted that on examination Baby A had ‘adequate central tone’, with two beats of clonus, improved tone, and symmetric Moro reflex. He was transferred to the postnatal ward to establish full oral feeding. The NICU summary documented:

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<sup>12</sup> A drop in blood oxygen level below normal.

<sup>13</sup> Abnormally rapid heartbeat.



'[Baby A] was diagnosed with HIE stage 1 on day 1 of life due to persistent irritability with mild central hypotonia and peripheral hypertonia. His neurological examination has normalised. [Baby A] is breastfeeding well with occasional top ups.'

51. On Day 6 Baby A was discharged home. He was noted to be 'bottle feeding [expressed breast milk] well'. As Baby A's weight was down 10.4% from birth, he was discharged with a plan for midwifery follow-up in the community the next day and to return to hospital for consideration of nasogastric feeding if his weight loss continued. A follow-up review was planned in clinic with Dr C in four months' time.
52. On examination at discharge, Baby A was mildly hypotonic (within normal range for a newborn baby) and had normal newborn reflexes, including a complete Moro reflex. The discharge summary documented Baby A's 'Diagnosis and Problems' as: 'Meconium exposure, respiratory distress syndrome, meconium aspiration syndrome, HIE stage 1.'
53. Following discharge, Baby A's mother noted that he was 'choking and gagging' with bottle feeds and was not gaining weight. He was admitted to hospital and discharged home with a nasogastric feeding tube in situ. Baby A received input from a speech and language therapist, and his feeding tube was able to be removed after approximately five days.

### **Subsequent events**

54. Dr C reviewed Baby A at four months of age. On examination, Dr C noted that Baby A showed early signs of cerebral palsy.
55. Dr C told HDC that at this review, Mrs A was spoken to about the 'potential missed opportunity' for therapeutic hypothermia, and options for her to make a formal complaint were discussed. Dr C also submitted an incident report, lodged an ACC claim, and led the Newborn Services morbidity review to discuss what the service could do to improve the care of babies at risk of encephalopathy.
56. At 9.5 months of age, Baby A was referred to a neurodevelopmental paediatrician for ongoing follow-up. Subsequently, Baby A was diagnosed with cerebral palsy and is continuing to undergo assessment to determine the underlying cause.

### **Education and training**

57. At the time of events, Dr B had been working as a junior registrar in NICU at National Women's Hospital for a short time. This was Dr B's first experience in a NICU.
58. Dr B stated that at this stage, three months of training as a paediatric neurology house officer had been completed and Dr B felt comfortable in assessing neurology and performing neurological examinations. Dr B said that prior to commencing work as a registrar in NICU, Neonatal Life Support and Advanced Paediatric Life Support courses had been completed.

### *NICU orientation and teaching*

59. Dr C told HDC that a 'structured orientation programme' is delivered at the start of each registrar rotation, and the registrars are given a 'Newborn Service Orientation Booklet'. The first three days of the programme include practical teaching on neonatal resuscitation,

orientation to NICU, admission paperwork (including the Newborn Record), the database, and guidelines.

60. Dr C stated that the rest of the NICU teachings, including for neonatal encephalopathy, are provided 'over the next few weeks'. Dr C explained that the teaching session on neonatal encephalopathy was delivered two months after Baby A's birth.
61. Dr B confirmed that standard protocols when admitting neonates to NICU were covered during orientation. Dr B stated that Sarnat scoring and HIE assessment and management were not covered during orientation and noted that this was not covered in the orientation booklet in detail. Dr B confirmed that a teaching session covering these details was provided two months after the birth of Baby A.
62. Health NZ provided HDC with a copy of the December 2019 Newborn Service Orientation Booklet. The booklet details NICU procedures and how to access clinical guidelines. Under the heading 'Educational Objectives', there is a list of topics for which good knowledge is recommended, including 'birth asphyxia<sup>14</sup>'.
63. Under the heading 'Specific Guidelines', the Newborn Service Orientation Booklet states that resident medical officers should refer to the website for clinical guidelines relevant to NICU. There is no further guidance about specific recommended guidelines to review.

### Staffing

64. Dr B told HDC that there were some challenges related to staffing during the night shift on which Baby A was born, which included a busy shift, having to take on additional responsibilities, and working with less experienced support staff. Dr B stated:

'[I]t was a busy night shift and I believe I spent several hours at a delivery of very preterm twins following this baby's admission. These deliveries would usually be attended by the Level 3 registrar as they were under 32 weeks gestation, however I was required to attend these on top of the above responsibilities as the Level three registrar was already busy. These deliveries continued until after our normal handover time, at which point I was relieved by one of the nurse specialists. There was no opportunity to return to check paperwork, nor had any concerns been flagged to suggest that there was a need to ...

I was working that night with another registrar, and no senior nurse specialist or nurse practitioner was routinely working overnight on Thursday nights at that time for support. These Thursday nights were particularly challenging as there was often less experienced support in the unit overnight. I understand the roster has been changed since then to ensure this is no longer the case.'

65. In response to the provisional opinion, Health NZ provided further information on the staffing levels. NICU was 75% occupied with a high acuity (intensity of nursing needed) and patient complexity. Dr B was responsible for 16 patients in high dependency, special care,

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<sup>14</sup> Insufficient oxygen to the brain and other organs before, during, or just after birth.

and parent infant nursery. Health NZ noted that Dr B also covered the postnatal wards and would have been contacted by the relevant midwives and nurses with any concerns about those babies.

### **Supervision**

66. Dr C told HDC that each registrar in Health NZ Te Toka Tumai Auckland's Newborn Service is allocated a mentor/supervisor with the expectation that they will meet at the beginning, middle, and end of the rotation, and as needed during the rotation. Dr C stated that supervision on a day-to-day basis is provided by the neonatologist who is on service during the weekdays or on call after hours. Dr C said that supervision after hours is on an as-needed basis, and if a registrar, depending on their level of training and experience, feels competent to manage a patient, they do not always contact the neonatologist on call.

### **Policies and procedures**

67. Dr C told HDC that at the time of Baby A's NICU admission, it was not standard protocol for the modified Sarnat score to be serially documented on a separate document.
68. Dr B stated: 'I do not believe there were any Auckland NICU specific HIE guidelines, algorithm, or protocols in ... 2020 to guide assessment and management.'
69. Dr C said that NICU had a guideline for therapeutic hypothermia from circa 2005, and there has been a national document on neonatal encephalopathy since 2015, which is available on the website.
70. Dr C stated that in 2019 there was a NICU neonatal encephalopathy guide with links to national neonatal encephalopathy documents. This included a modified Sarnat scoring sheet and wording as set out below:

'1. For infants requiring resuscitation at birth, a note should be made of:

- A. time for regular spontaneous ventilation to be established
  - B. time to first detection of a heart rate
  - C. time to Heart rate > 100, as a slow recovery of the heart rate (>100bpm) despite adequate resuscitation may indicate a severe insult
  - D. meconium staining of umbilical cord and skin as it suggests prolonged exposure to meconium (> 3 hrs)
2. Observe neurological signs and evaluate severity of the encephalopathy as per Figure 1. If available also consider cotside amplitude integrated EEG monitoring
3. Aim to complete assessment & initiate plan within the first 60 min after birth

Discuss with local Level III centre with respect to appropriate transfer and potential use of passive cooling.

If appropriate initiate passive cooling and monitor temperature either continuously via rectal probe or every 15 min in axilla.

Encephalopathy progresses over time so serial observation is important. Use of the Simplified Sarnat Criteria<sup>7</sup> may assist in documenting progression.'

### **NICU Morbidity and Mortality review**

71. Baby A's case was reviewed in the NICU Morbidity and Mortality Review (M&M Review).
72. The M&M Review concluded that there was a delay in diagnosis/assessment. It noted that this possibly resulted in a delay in appropriate treatment, but that owing to the delay in assessment, this could not be determined.
73. The M&M Review identified the following 'system vulnerabilities':

'Discussed the HIE guideline, which is the [Newborn Clinical Network<sup>15</sup>] consensus statement and not [Health NZ Te Toka Tumai Auckland] specific. Also junior (first year trainees) registrars have little to no experience with HIE and need more focused education.'

### **ACC review**

74. ACC obtained advice from a neonatal paediatrician about the care provided to Baby A. The paediatrician advised that it was not reasonable and not appropriate that Baby A did not undergo a standard neurological assessment after birth. The paediatrician advised:

'With the history of foetal distress, but in particular the need for prolonged resuscitation and the significantly abnormal cord arterial blood gas, it is standard protocol in virtually all Level 3 intensive care units to assess the neurological status of babies immediately after admission to the Newborn unit and then for the ensuing 6 hours so that therapeutic hypothermia can be considered as it is one of the few interventions available to reduce the incidence of death and neurodevelopmental disability after [HIE]. Therapeutic hypothermia has been offered to all babies with significant (Stage 2 and above) hypoxic ischemic encephalopathy from late 2007 onwards.'

75. In response to the provisional report, Health NZ advised that it does not agree with the ACC advisor's statement that Baby A required prolonged resuscitation after birth, noting that although Baby A was born in a poor condition, he did not 'require endotracheal intubation, cardiac massage or intravenous adrenaline; interventions which would be required for a newborn baby needing prolonged resuscitation'.

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<sup>15</sup> Newborn Clinical Net.

### Further information

76. Dr C told HDC:

‘If [Baby A] had been examined and had the same findings before 6 hours of age as he had at 10.5 hours of age, he probably would have been offered therapeutic hypothermia, in the context of acidotic cord gases, low Apgar scores and requirement for resuscitation after birth.

It is not uncommon for neurological examination findings to evolve over the first 6 hours, which is why serial neurological examinations (modified Sarnat scores) are recommended. Therefore, it is difficult to speculate what the serial neurological examinations prior to 6 hours of age would have shown. If the examination had been consistent with stage 1 (mild) HIE, [Baby A] may not have been treated with therapeutic hypothermia as, while therapeutic hypothermia is effective for babies with moderate and severe HIE, there is no evidence that therapeutic hypothermia is effective in mild HIE [and] can cause serious side-effects.’

77. In response to the provisional opinion, Health NZ acknowledged that the Te Toka Tumai Auckland Newborn service did not have in place internal procedures and policies to ensure that babies at high risk of significant HIE were monitored appropriately, in keeping with acceptable standards at the time.

78. Health NZ told HDC that it wished to emphasise that ‘the lack of ongoing assessment (Sarnat scoring) may or may not have made a difference to the treatment provided at the time or to Baby A’s subsequent outcome’. Health NZ stated:

‘We do not know, because of the lack of assessment and/or documentation, the severity of [Baby A’s] HIE symptoms in the six hours after birth, which is the optimal time to commence therapeutic hypothermia to improve neurological outcome. [Baby A’s] neurological examination findings were consistent with mild HIE, with two features suggestive of moderate HIE at 10.5 hours of age (when he first had a full neurological assessment documented). The specialist neonatologist examining [Baby A] assessed him as having mild HIE. Therapeutic hypothermia was not at the time, and is currently not, standard of care for mild HIE.’

### Opinion: Dr B — adverse comment

79. In forming this opinion, I considered two distinct but related issues regarding Baby A’s care:

- His initial neurological assessment; and
- His subsequent neurological assessment and monitoring.

## Initial neurological assessment

### *Completion of routine neurological assessment*

80. At the time of Baby A's birth, the standard practice was for all babies (including those admitted to NICU) to undergo a routine neurological assessment, as part of the Newborn Record.<sup>16</sup> Dr C told HDC:

'The clinical practice at the time was that the registrar would examine the baby and if they had any concerns, they would contact the on-call specialist, who would need to come in and assess the baby clinically for signs of moderate to severe encephalopathy and make a clinical decision regarding the need for therapeutic hypothermia.'

81. As outlined in paragraph 22, Baby A's Newborn Record had 18 out of 22 sections ticked, with the tests related to neurology (tone and activity, Moro reflex, and grasp reflex) either blank or in one instance with a single line that is neither a tick nor a cross. The Newborn Record form states that a blank box indicates that a test was not completed.
82. At the time of Baby A's birth, Dr B had completed NICU orientation training on admission paperwork, which included the Newborn Record. On this basis I consider that Dr B was aware of the requirement to conduct this assessment and record such information adequately, and Dr B understood that leaving a box blank indicated that a test had not been done. I note, however, that Dr B explained that usual practice was to record that a test had not been done, rather than to leave the box blank.
83. Dr B told HDC that tone and activity and grasp reflex were likely assessed as part of other procedures, including Apgar testing at 1 and 5 minutes of age, insertion of an IV, and the other assessments that form the Newborn Record. Dr B stated that if any abnormalities had been observed at these times, these would have been recorded.
84. On the basis that tone and activity were likely assessed (and recorded) as part of the Apgar score at 1 and 5 minutes of age, and the grasp reflex would have been observed as part of IV insertion, I accept on the balance of probabilities that neurological assessment of Baby A more likely than not occurred, and at that time no issues were identified. This would appear to be confirmed by the lack of a call to the on-call consultant and the subsequent monitoring of Baby A, which did not indicate concerns until around 6am. In forming this view, I note that Dr C stated that 'it is not uncommon for neurological examination findings to evolve over the first 6 hours'.

### *Recording of routine neurological assessment*

85. A neurological examination for Baby A was not documented on the Newborn Record, or in Dr B's NICU admission notes or the nursing notes.
86. In response to the lack of a completed Newborn Record, Dr B highlighted that the lactate results from the cord gases were not available at the time. Dr B stated:

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<sup>16</sup> Royal Australasian College of Physicians, 'Examination of the Newborn'.

'[T]he documentation likely stayed with the midwife in the delivery suite for their completion while I went to NICU with the baby for ongoing management. This [Newborn Record] would then have been returned at a later time. It is likely I did not return to complete this later, whilst being busy with other deliveries and no further concerns being flagged.'

87. I have reviewed the form and confirm that someone other than Dr B completed the cord lactates section.
88. Whilst this does offer some explanation for the lack of a completed record, I remain critical of Dr B for not completing the Newborn Record documentation. Considering Baby A's relative risk after his birth, there would be a reasonable expectation that the neurological examination be recorded clearly, to ensure that a full and complete picture of Baby A's health was available for all others responsible for his care moving forward.
89. I accept that Dr B experienced a heavy and complex clinical workload on the night Baby A was admitted to NICU, and that it is more likely than not that Dr B did not have an opportunity to review and complete the paperwork. I note that on handover, Dr C appears not to have reviewed the Newborn Record (and thereby the neurological assessments), and, as such, an opportunity was missed for Dr B to complete the paperwork whilst the events were fresh in Dr B's mind.
90. The Medical Council of New Zealand's publication *Good Medical Practice* states that clear and accurate patient records must be kept that report relevant clinical information, options discussed, decisions made and the reasons for them, and information given to patients. In previous reports, HDC has made numerous comments stressing the importance of good record-keeping and the accuracy of clinical records.<sup>17</sup>
91. I am critical that Dr B did not record that the neurological examination had been completed, and thereby failed to maintain appropriate records associated with Baby A's care.
92. I note that both Health NZ and Dr B accept that the examination was not recorded adequately. Dr B told HDC: 'This investigation ... has helped me reflect on the importance of thorough and complete documentation.'

## **Opinion: Health NZ Te Toka Tumai Auckland — breach**

### **Subsequent neurological assessments**

#### *Relevant standards, guidelines, and best practice*

93. At the time of Baby A's birth, the national guidelines in place were the 'Observation and management of infants at risk of neonatal encephalopathy' (Management of HIE) and the 'Neonatal Encephalopathy Consensus Statement from the Newborn Clinical Network' (the Consensus Statement).

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<sup>17</sup> For example: 19HDC01547, 12HDC00437, and 11HDC01103.



94. The Management of HIE states:

'[I]t is important that all infants who are at risk have adequate observation and documentation of the findings. All babies with abnormal cord gases and/or lactates who are unwell enough to require admission to NICU will be monitored for encephalopathy using the modified Sarnat criteria (see national Neonatal Encephalopathy Consensus Statement).'

95. The Consensus Statement emphasises that 'recognition and documentation of neonatal encephalopathy is vital to subsequent management and neonatal outcome', and on that basis there should be a low threshold for discussion with the senior paediatric team. The Consensus Statement also provides that 'observation of neurological signs to evaluate severity of the encephalopathy should occur', and that 'encephalopathy progresses over time so serial observation (hourly) is important', noting that the Sarnat criteria may assist.

96. The Sarnat criteria/score is calculated from a list of objective criteria to assess signs of encephalopathy hourly between one and six hours of age. The purpose of this assessment is to determine whether the baby fits the criteria for therapeutic hypothermia, an intervention available to potentially reduce the risk of developing a neurodevelopmental disability.

*Were the standards, guidelines, and best practice followed?*

97. Having reviewed records of Baby A's birth, paediatric neonatologist Dr C (Auckland City Hospital) and a neonatal paediatrician advisor (ACC) both considered Baby A to be at high risk of HIE after birth.

98. Both doctors stated that standard practice at the time for managing such risk was to conduct an initial neurological assessment and subsequent 'serial' observations every hour for the following six hours, in line with the national guidelines. I accept that this was the relevant standard and practice at the time.

99. I acknowledge that at the time, there was no separate Sarnat recording sheet to indicate neurological testing and any subsequent results clearly.

100. I note that it appears that Dr C did not check the Newborn Record after assessing Baby A at 10.5 hours of age when Baby A was showing signs of mild–moderate HIE. This appears to be a missed opportunity for clarification regarding Baby A's neurological assessments.

101. On review of the available information, it is apparent that Baby A did not receive any further specific neurological assessment or serial monitoring in line with his risk, as required under the national guidelines.

*Systemic issues: education, training, and lack of Auckland NICU-specific protocols*

102. Dr B told HDC that at the time, there were no Auckland NICU-specific HIE guidelines, algorithms, or protocols to guide practice. Dr B also stated that HIE assessment, management, and Sarnat scoring were not covered as part of the initial orientation to Auckland NICU and were not outlined in the orientation booklet.

103. Dr C told HDC that neonatal encephalopathy training is usually provided to registrars in the first few weeks of their NICU rotation, but because of public holidays, this specific training was not offered until after Baby A's birth, at which time it was completed by Dr B.
104. On this basis, it appears that at the time of Baby A's birth, Dr B had not received training in, and did not have specific knowledge of, neonatal encephalopathy and how to assess or respond to it. Further to this, there were no Health NZ internal protocols or processes in place that could be relied upon and reflected the accepted national standards and guidelines.
105. I note that the M&M Review of Baby A's birth also highlighted this systems issue. The Review stated:
- 'Discussed the HIE guideline, which is the [Newborn Clinical Network] consensus statement and not [Health NZ Te Toka Tumai Auckland] specific. Also junior (first year trainees) registrars have little to no experience with HIE and need more focused education.'
106. The difficulties of Baby A's birth resulted in him being at high risk of HIE. Relevant national guidelines in place at the time indicate that Baby A should have received an initial neurological assessment, followed by serial (hourly) assessments for the first six hours of his life. Having reviewed the available information, it appears that he did not receive repeated assessments. Health NZ had no internal policies or processes in place at the time to ensure that this occurred. I am critical that Health NZ did not have in place sufficient policies and procedures to support its staff adequately regarding Baby A's neurological assessments and monitoring.
107. In response to the provisional opinion, Health NZ accepted this view.
108. I am not critical of Dr B for the failure to conduct serial neurological assessments. Although Dr B held responsibility for Baby A's care, based on the information gathered, I consider that Dr B's failure in this regard is attributable to Health NZ at an organisational level.
109. Health NZ's internal training and processes were not sufficient to support Dr B in the care of Baby A during those first few hours. In the absence of internal protocols or processes specific to HIE assessment and management, reliance was placed on practitioners having completed a training session and having enough knowledge about the subject matter to search for the specific external guidelines on the website to guide their practice. I consider that this was unreasonable.
110. Under Right 4(2) of the Code, Health NZ had a duty to ensure that the services Baby A received at Auckland City Hospital complied with legal, professional, ethical, and other relevant standards.
111. Health NZ was required to comply with the Health and Disability Services Standards 2008 (HDS Standards). The HDS Standards are designed to establish safe and reasonable levels of

services for consumers, and to reduce the risk to consumers from those services. This necessitated having robust policies/procedures and safety-netting in place.

112. I consider that Health NZ failed to provide services to Baby A that complied with relevant standards, including the HDS Standards, for the following reasons:

- Dr B was not provided with neonatal encephalopathy training in a timely manner;<sup>18</sup>
- The orientation booklet did not include information about neonatal encephalopathy or refer to specific guidelines to guide practice;<sup>19</sup>
- There were no internal policies and procedures in place to ensure that babies at high risk of HIE were managed and monitored using serial Sarnat scoring, in accordance with national guidance on neonatal encephalopathy at the time.<sup>20</sup>

113. In response to the provisional opinion, Health NZ accepted that it had not provided the appropriate standard of care for Baby A. Health NZ told HDC:

‘We accept that a deficit in education and training of registrars as well as a lack of Te Toka Tumai NICU specific HIE protocols resulted in [Baby A’s] clinical care not complying with acceptable standards. We have learned from this and have implemented a number of changes to ensure an incident like this does not occur again.’

114. For the reasons outlined above, I find Health NZ Te Toka Tumai Auckland in breach of Right 4(2) of the Code.

## Changes made since events

### *Development of Auckland-specific protocols and processes*

115. As a result of the review of the care Baby A received following his birth, an Auckland guideline for managing babies at risk of encephalopathy was completed, and this includes a modified Sarnat score to assess a baby hourly for signs of encephalopathy.

### *Changes to orientation and training*

116. In October 2020, the orientation booklet was updated to include specific reference to the national HIE and therapeutic hypothermia guidelines and listed these as necessary reading.

117. The orientation booklet now contains a new section under the heading ‘High risk delivery — Senior Medical Officer attendance’, which states:

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<sup>18</sup> Health and Disability Standard 2.7.4: new service providers receive an orientation/induction programme that covers the essential components of the service provided.

<sup>19</sup> Health and Disability Standard 2.7.4: new service providers receive an orientation/induction programme that covers the essential components of the service provided.

<sup>20</sup> Health and Disability Standard 2.3.3: the service develops and implements policies that are aligned with current good practice and service delivery, meet the requirements of legislation and are reviewed at regular intervals as defined by policy.

'It is envisaged that ... [f]or any case in which the infant resuscitation was unexpectedly complex or where there is a poor response to resuscitation the attending neonatologist should be called urgently.

The attending neonatologist should be notified shortly before or as soon as practicable following the admission of infants to level 3 care who are ... ventilated or have significant respiratory disease.'

118. There is now an hour-long orientation training session dedicated to neonatal encephalopathy, including familiarisation with the relevant national guidelines and Sarnat scoring.

#### *Changes to staffing*

119. Health NZ Te Toka Tumai Auckland changed the roster to ensure that an experienced NICU nurse practitioner is rostered on overnight every night.

#### *Dr B*

120. Dr B continues to reflect on the importance of thorough and complete documentation, ensures that this is done to a high standard, and encourages those more junior to do the same.
121. Dr B advised that information from relevant protocols is included to ensure that others reading the notes can follow the decision-making process clearly. Dr B told HDC:

'I hope that this investigation provides useful learning points for both NICU and other junior doctors to ensure that circumstances like this do not arise again leading to uncertainty and stress for those involved. I hope that the changes subsequently made to NICU orientation and HIE protocols avoid similar situations to this occurring in the future.'

## **Recommendations**

122. In making recommendations, I have considered Mrs A's desired outcomes in raising the complaint, which include improved systems and apologies from relevant parties.
123. I have also taken into consideration the system changes made by Health NZ since the time of events, which include the development of Auckland-specific protocols, enhanced training, and more specific orientation documentation and guidance.
124. Taking the above into account, I recommend that Health NZ Te Toka Tumai Auckland:
- a) Provide a formal written apology to Mrs A and her family for the identified system deficiencies. The apology should be sent to HDC, for forwarding to Mrs A, within three weeks of the date of this decision.
  - b) Conduct an audit of the completion of 30 newborn assessment records over a period of three months prior to the date of this report. The result of the audit and any issues

identified through this process, along with steps to address any issues identified, should be provided to HDC within three months of the date of this decision.

125. I recommend that Dr B provide a formal written apology to Mrs A and her family for failing to record Baby A's newborn neurological examination. The apology should be sent to HDC, for forwarding to Mrs A, within three weeks of the date of this decision.

### **Follow-up actions**

126. A copy of this report with details identifying the parties removed, except Health NZ Te Toka Tumai Auckland and Auckland City Hospital, will be sent to the Medical Council of New Zealand, and it will be advised of Dr B's name in covering correspondence.
127. A copy of this report with details identifying the parties removed, except Health NZ Te Toka Tumai Auckland and Auckland City Hospital, will be sent to Health NZ and placed on the Health and Disability Commissioner website, [www.hdc.org.nz](http://www.hdc.org.nz), for educational purposes.