Referred from: Oslo Municipal Emergency Clinic
Primary care physician: Fast Lege
Reason for referral: Shortness of breath.

Present: Father, mother, on-call physician, and medical student. Information provided by parents through direct interview and previous medical records.

Background:
Male, 5 months old. Born at Ullevål Hospital. Both parents are ethnically Norwegian and fluent in Norwegian. First child of the parents. Neither parent smokes. No carpets in the home. Mother is on maternity leave, works as a preschool teacher. Father works full-time as a civil engineer. The child's maternal grandmother is actively involved in care, visiting daily to help the mother.

Family history: The mother's sister died suddenly in infancy, suspected SIDS (Sudden Infant Death Syndrome), cause not confirmed. No known hereditary diseases otherwise.

Pregnancy and delivery:
Mother developed preeclampsia in the third trimester of pregnancy. Closely monitored during the last two weeks of pregnancy due to reduced fetal growth. Admitted to the observation unit three days before delivery and treated with labetalol. Labor induced. Vacuum-assisted delivery due to slow progress and abnormal CTG. One vacuum extraction, uncomplicated Born at a gestational age of 39+6 weeks. Birth weight 3640 grams (50th percentile), length 51 cm (50th percentile), and head circumference 36 cm (50th percentile). Apgar scores of 6/8/9. He was admitted to the neonatal intensive care unit from the delivery ward due to labored respiration, need for CPAP support, and hypoglycemia. Discharged to the postpartum ward after one day. No suspicion of infection or indications of asphyxia. Tongue-tie was cut at 4 days old due to breastfeeding problems.

Vaccination status: Follows the Norwegian childhood vaccination program.

Growth and development: Attends regular health checkups. Additionally followed more closely for the first two months due to poor weight gain. After switching to a cow's milk protein-free diet at 3 months of age, growth stabilized at the 25th percentile. Normal development for age. Babbles and smiles. Shows good interaction with parents. Has rolled from stomach to back but not from back to stomach. Supports himself well on his hands when prone and holds his head steadily under normal circumstances. Has just begun trying small tastes of vegetables and porridge.

Previous illnesses:

- Followed closely at the health center due to breastfeeding issues and stagnating weight development from 2 months of age. Evaluated at the pediatric outpatient clinic on 15.08.24 due to restlessness, bloody stools, and stagnating growth. Suspected cow's milk protein allergy. The mother had a low milk supply and wished to stop breastfeeding. Therefore, switched to a cow's milk protein-free formula (Althera). After three weeks on the specialized formula, the bloody stools and restlessness resolved. Good weight gain followed, now on the 25th percentile.

- Evaluated at the pediatric emergency department on 20.09.24 due to lethargy, cough, and nasal congestion. Rhinovirus detected on nasopharyngeal PCR. No interventions, spontaneous recovery.
- Evaluated at the pediatric emergency department on 01.10.24 due to a three-day history of cough, respiratory distress, and poor intake. Administered paracetamol 10 mg/kg suppository with effect. Observed for six hours, then discharged. Rhinovirus and parainfluenza virus detected on nasopharyngeal PCR.

Allergies: No known medication allergies or other allergies.

Current situation:
Referred from the emergency clinic. Present with both parents. Since the viral infection detected on 01.10, the child has been more lethargic than usual, but has been consuming an adequate amount of fluids and gradually improving. Four days ago, the child developed a fever of 38.5°C. The child was irritable and appeared to be in pain. Administered paracetamol 10 mg/kg suppository at home with good effect. The child then improved and slept peacefully through the night. Three days ago, the child developed a worsening cough and nasal congestion. Intermittent fever continued, but with good response to paracetamol. The child was evaluated at the emergency clinic, had a low CRP, and a viral infection was suspected. Over the last two days, the child has experienced increasing productive cough, worsening respiratory distress with gurgling respiratory sounds from the chest, and rapid breathing. Vomited twice yesterday and twice today, always during coughing fits. No diarrhea. By the evening, the mother reports that the child has become increasingly lethargic and tired, mostly lying in bed and sleeping. The mother does not believe the child has lost weight.

Natural functions:

- **Urination:** Normally has 3-5 wet diapers daily. No wet diaper today as far as the mother can recall. Two wet diapers yesterday, one of which was around midnight.
- **Bowel movements:** Normally has regular bowel movements, Bristol stool chart type 5. No change in the last week.
- **Appetite:** Normally has a good appetite. Drinks 3-5 bottles of 150-200 ml formula daily. Additionally, small amounts of solid food. In the last two days, a gradual reduction in formula intake. Yesterday drank about 400-500 ml formula. Today consumed 200-300 ml formula.
- **Sleep:** Usually sleeps well at night. Wakes 1-2 times per night but falls back asleep quickly. The past week, more restless, wakes easily. Over the last 24 hours, has been more sleepy and fatigued. Slept more than usual this evening.
- **Activity:** Normally active and social. Smiles when seeing people. Over the last 24 hours, has not been interested in toys or comfort objects. Prefers to lie alone.

Medications:
Vitamin D drops 10 µg daily.

Status at 14.10.24 at 23:15:
Lying in the mother's arms. Appears in reduced general condition, weak, and tired. Opens his eyes and follows visually when addressed, showing some initial interest in the surroundings.

There is no resistance during examination. The eyes appear hollow, and the anterior fontanelle is soft but slightly sunken. There are no standing skin folds or signs of edema, rash, petechiae, cyanosis, or jaundice on the skin. He has rapid, labored breathing with subcostal and intercostal retractions. Coughs several times. The skin is pale.

Weight: 7 kg (50th percentile). Length: 67 cm (50th percentile). Head circumference: 43 cm (50th percentile).

HR: 180 bpm (elevated, reference 100-160).
Capillary refill time: 3 seconds (prolonged, reference <2 sec)
Respiratory rate: 60/min (elevated, reference 35-45)
Rectal temperature: 38°C (elevated, reference 37°C)
SpO2: 92% (low, reference >96%)
BP: 80/50 mmHg (normal, reference 75-100/40-55)
PEWS: 4

*(*PEWS is not included in the template, but it is good to include if available or if you can assess it based on measurements).*

Otoscopy: Mildly reddened tympanic membranes bilaterally, no visible fluid in the middle ear, visible light reflex.
Fauces: Red mucosa, symmetrical tonsils with clear midline, no pus. Intact palate.
Neck: No neck stiffness. No palpable lymph nodes.
Thorax: Normal configuration. Subcostal and intercostal retractions.
Heart: Regular rhythm, clear tones, no murmurs.
Lungs: Inspiratory and expiratory coarse crackles in the central airways. Symmetrical breath sounds. No basal crackles. No dullness on percussion bilaterally.
Abdomen: Normal configuration, normal bowel sounds, soft and non-tender, palpable femoral pulses bilaterally.
Genitalia: Normal male genitalia. Both testicles in the scrotum.
Rectal examination: Not performed, no indication.
Reflexes: Moro, grasp, and suck reflexes not elicited.

Supplementary investigations:
Blood tests: Hb 12.1 (10.3-14.4), WBC 17 (6.3-15.5), lymphocytes 7 (1.7-6.7), CRP 11 (<5). pH 7,35 (7,35-7,45), **pCO2 6,3** (4,7-6,3), **BE -6** (-3-3) creatinin 16 (15-31**), s-glucose 7,1** (3,3-5,5),
Chest X-ray: No pneumothorax. Bilateral perihilar opacities.
Nasopharyngeal PCR: Taken, awaiting results.

Assessment/Plan:
5-month-old full-term male with known cow's milk protein allergy, otherwise healthy with normal development. Two viral respiratory infections in the past month from which he has been gradually recovering. Referred today from the Emergency clinic with a four-day history of fever, reduced general condition, and cough. In the past 24 hours, increasing productive cough, vomiting, lethargy, and reduced fluid intake. Upon examination, the child is in a reduced general state with clear respiratory distress, rapid respiratory rate, and intercostal and subcostal retractions. SpO2 92%. Pronounced coarse inspiratory and expiratory sounds consistent with mucus/secretions in the central airways. Also moderately dehydrated with

sunken eyes, tachycardia (HR 180 bpm), reduced ability to drink, reduced urine output, and prolonged capillary refill time. Biochemically, there is a slight increase in CRP and white blood cell count.

Clinically and biochemically consistent with viral bronchiolitis with subsequent dehydration due to reduced fluid intake in the past 24 hours.

Plan:

- Paracetamol 15 mg/kg orally.
- The patient will be placed on High Flow 2L/kg after the chest X-ray is taken.
- Inhalation with 2 ml NaCl 9 mg/ml via nebulizer can be administered as needed, but should not be used if it causes stress to the child.
- A nasogastric tube will be placed, and the patient will be rehydrated with 10 ml/kg/hour of formula over 6 hours
- Reassessment in one hour.
    - If there is no respiratory improvement, consider CPAP and a higher level of care.
    - If there is no effect from paracetamol and oral fluids, consider IV fluids.

Addendum 16.10: RSV and metapneumovirus detected on nasopharyngeal PCR