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Respiratory distress – Beyond the lung

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Respiratory distress

- Definition – Clinical state characterized by increased rate & increased respiratory efforts

OR

- It refers to any type of subjective difficulty in breathing.

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Features of respiratory distress

- Tachypnea
- Dyspnea
- Nasal flaring
- Chest wall retraction
- Added sounds
- Head bobbing

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Features of Respiratory failure

- Clinical definition : Severe respiratory distress with **central nervous system changes** and cardiovascular manifestation
  - **CNS changes-** lethargy, somnolence ,seizures and coma
  - **CVS changes-** marked tachycardia, or bradycardia, hypotension
- **paCO2 of >50 or paO2 of <60** while breathing 40% oxygen

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Case 1

- An 7-year-old boy referred from the outlying hospital

- ✓ Cough for 3 days
- ✓ Vomiting since 2 days
- ✓ Difficulty in breathing for 1 day

- **G/E**:- Lethargic but oriented
  - HR-144/min
  - RR- 48/min
  - Peripheral pulses weak
  - CRT > 3sec
  - Spo2- 98 % at room air
  - NBP- 90/62
  - UOP- adequate
- **S/E**:-
  - Chest -Bilateral air entry equal, No stridor or wheeze
    - Effortless tachypnea present
    - No intercostal retractions
- Rest of the systemic examination normal

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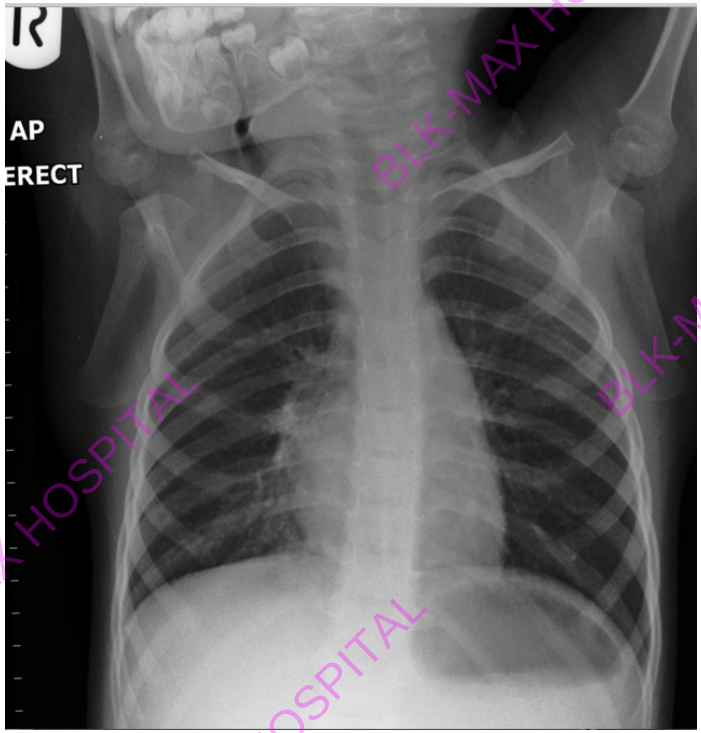
Case 1

- Started on IV fluids (fluid bolus given) and oxygen
- Nebulisations with Levolin started
- CXR done



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Case 1

- What do you think it is ??
- VBG- pH-7.0/ PCo2-12/ HC03-4.5
  lac 1.8
- RBS - very high.
- H/o polydipsia, polyuria and weight loss
- Urine – 4+ glucose and large ketones
- Diagnosed as Diabetes Ketoacidosis.

Effortless tachypnoea
Chest B/l clear
RBS
Venous blood gas

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Case 2

- 13 years old male child
  - Cough/cold since last 4 days
  - Difficulty in swallowing with vomiting since last 2 days
  - Poor oral intake since last 1 day.

- **At admission**
  - Anxious
  - HR- 120/min
  - RR- 18/min
  - SPo2- 85% at room air
  - Perfusion good
  - BP -110/70

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Case

- Chest-B/L air entry equal

  Shallow respiration

  Paradoxical breathing

Shifted to PICU

Anxious , restless

- Spo2- 97 % at NRM
- VBG- 7.31/ **PCo2 – 48** / HCO3- 25
- CXR done

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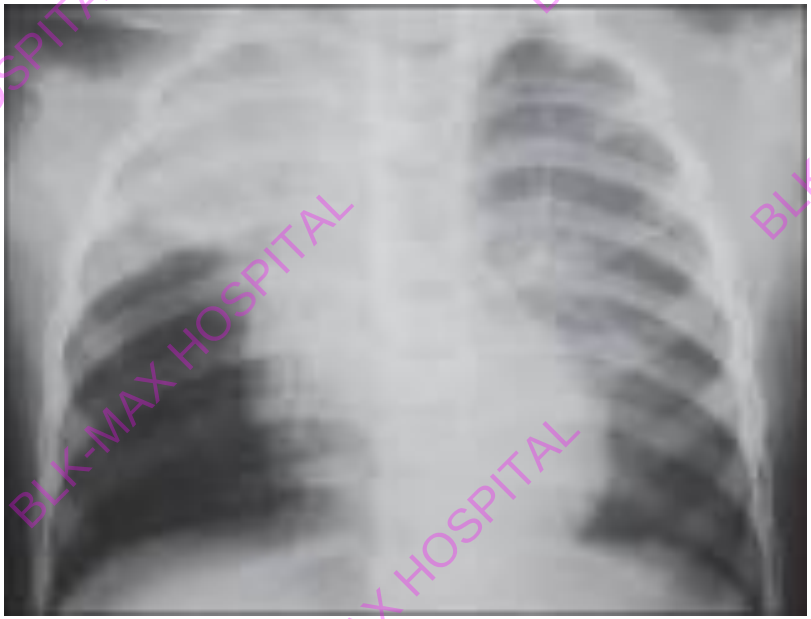
Case

- Management : **A B C - intubated**
- Detail history & examination
  - Intermittent Drooling
  - Nasal twang
  - B/L opthalmoplegia
  - Ataxia
  - Areflexia

Spo2- 85% at room air
Paradoxical respiration



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Case

- **Work up -**
  - CSF- no albumin-cytological dissociation
  - MRI brain and spine- Normal
  - NCV – H and F reflex absent
- **Diagnosed as Gullian Barre Syndrome (?Miller Fisher Variant)**
  - IVIG was given
- Child extubated after 2 days and weakness improved later

Case 3

- 7 y girl presented with
  - Fever 5 days
  - Recurrent vomiting 5 days
  - Red urine 5 days
  - Breathing difficulty 2 days

- **On examination**
  - Irritable
  - HR-158/min
  - RR- 46/min
  - Spo2- 80 % at room air
  - Peripheral pulses palpable
  - NBP- 136/108
  - Generalised swelling +
  - Chest-B/L air entry equal , bilateral coarse crepts, Retractions present
  - Rest of the S/E with in normal limits

Clinical diagnosis ?

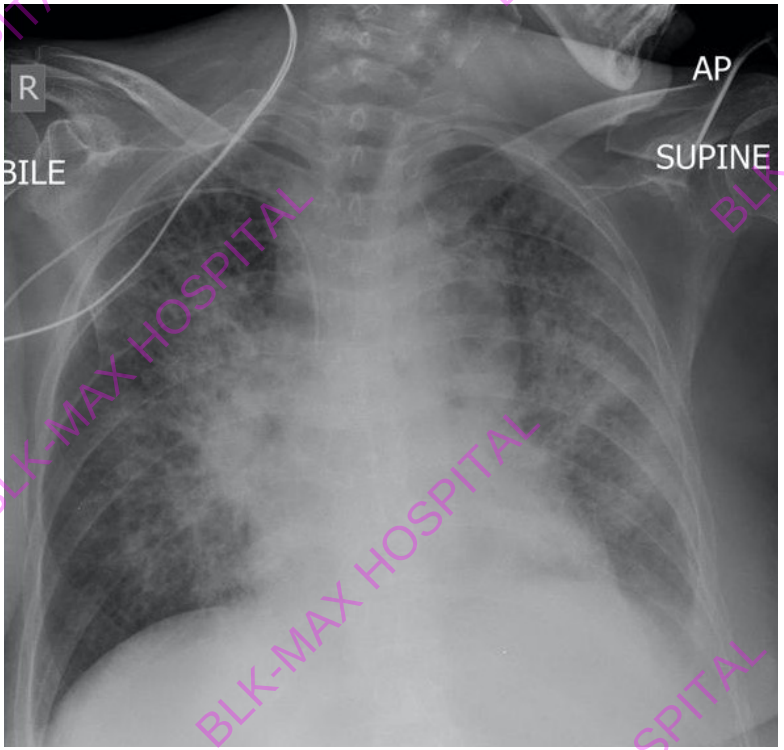
- VBG- 7.25/ PCo2- 30/ Hco3- 18/ Lactate- 0.8

Hypertension
Red Urine
Generalised Swelling

Acute glomerulonephritis

Hypertensive emergency with CCF and pulmonary edema

History of edema, preceding history of sore throat or pyoderma, other systemic manifestations, burning micturion absent



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Case

- Sepsis work up including
  - CBC, peripheral smear, LDH
  - Renal function tests
  - Urine R/M
  - Spot urine protein/creatinine ratio
- Started on BiPAP support
- I/V frusemide
- Labetalol infusion
- Antibiotics

CBC- 10.1 / 14200, P 93 L4 / 3.52 lac

Urea/Creat - 30.5/ 1.8

Urine R/M- RBCs full field

Urine pr/cr ratio -6.92 mg/mg (n<0.2)

ASO - 427.03 IU/ML (n< 200)

C3 - 34 mg/dl (80-160mg/dl)

ANA - negative

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Case

- Patient discharged on D4 on Amlodipine, with normal renal functions and good urine output
- Gross hematuria subsided in one week
- Off antihypertensives by 2 weeks
- Proteinuria subsided by 3 weeks

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Case 4

- 3 ½ month old female infant
  - Cough and cold X 3 days
  - Excessive crying & irritability X 10-12 hrs
  - Fast breathing X 4 hrs
  - Refusal to feed X 4 hrs
- No H/o fever, loose motions, vomiting, cyanosis, seizures, decreased urine output.

- **G/E**:-Lethargic
  - HR-**184/min**
  - RR- **50/min**
  - Peripheral pulses feeble
  - CRT **> 3sec**
  - Spo2- **not recordable**
  - NBP- **66/31**
- **S/E**:-
  - Chest: B/l good air entry, no added sounds ,min SCR +, ICR +
  - CVS: S_1 S_2 normal, gallop
  - Abdomen: soft, no distension, **liver 3 cm below Rt SCM**

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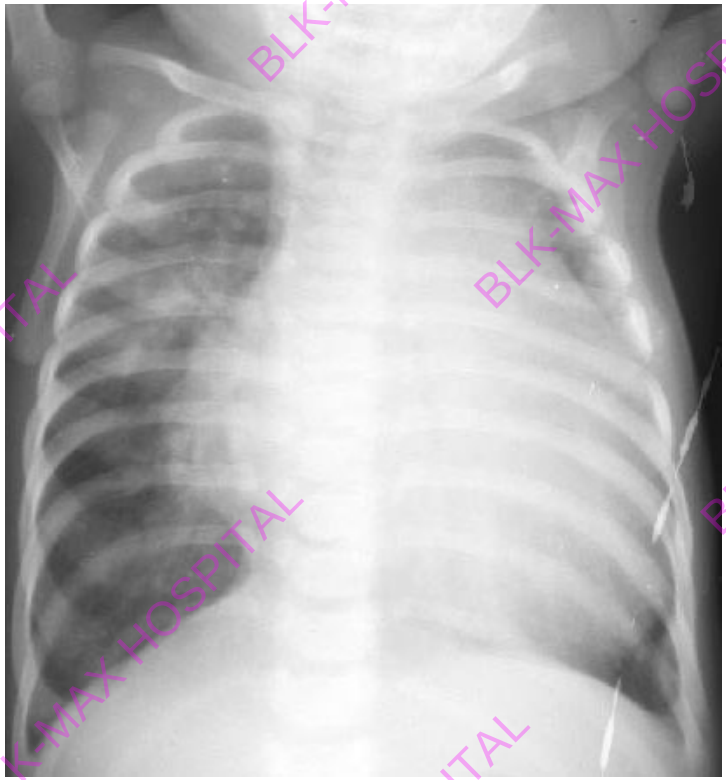
Case

- Management – **A B C**
  - **VBG**: pH **6.9**, PCO_2 50 , HCO_3^- **10,** lactate- **6.5**
- Normal electrolytes & RBS



Cause – Viral myocarditis

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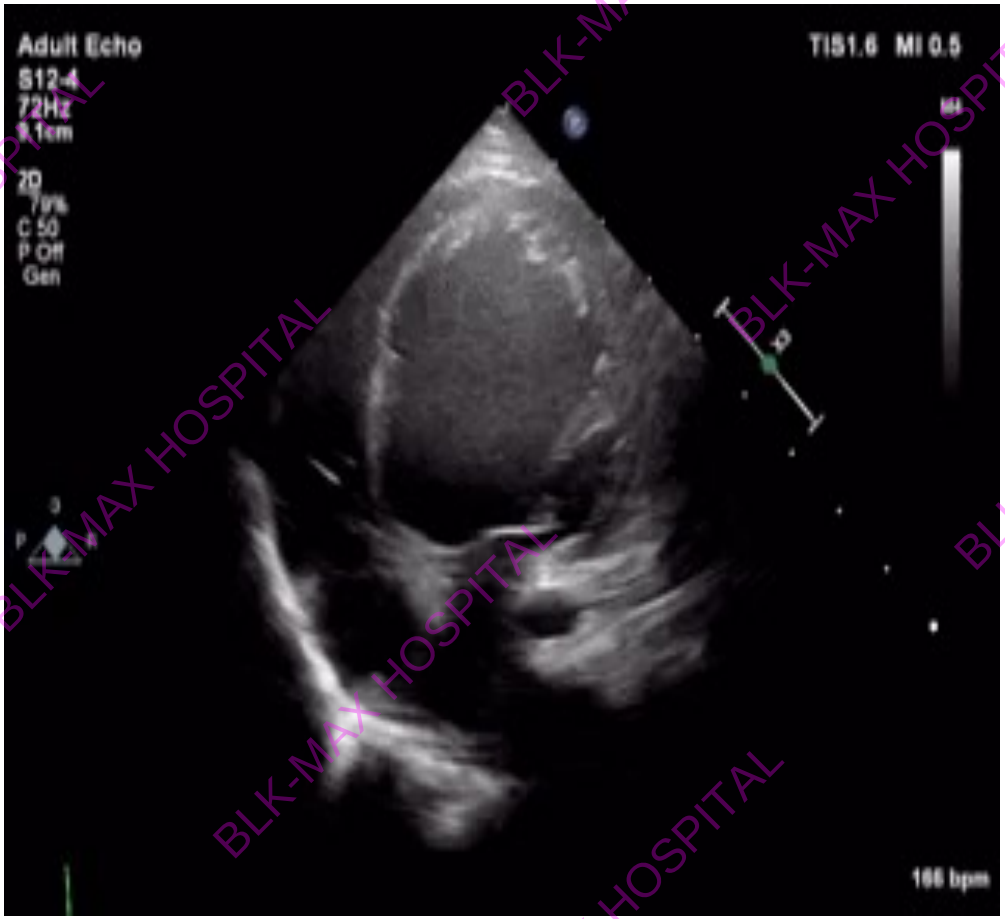
Case

- ECHO
- CPK -MB - 130
- Trop I – 75 ng/ml

  (n<0.1ng/ml)
- ECG- sinus

  rhythm, reduced

  QRS voltage



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Pearls of Management

- Use **small fluid boluses** 2 ml/kg
- **Early inotropes**
- Caution while Intubation-

  Physiological difficult airway
- Tolerate lower BP
- Optimize Preload - diuretics
- Once BP maintained, **vasodilators** to be added

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Case 5

- 4 year old male child, referred from outlying hospital with complaints of

  - Loose stools since 3 days
  - Breathing difficulty since 1 day
  - Altered sensorium since 1 day

- **G/E**:- Poor sensorium
  - HR-164/min
  - RR- 48/min
  - Peripheral pulses well felt
  - CRT > 3sec
  - Spo2- 88 % at room air
  - NBP- 90/52
  - UOP- adequate
- **S/E**:-
  - Chest -Bilateral air entry equal, No stridor or wheeze
  - CNS- GCS- 6/15
  - Rest of the systemic examination normal

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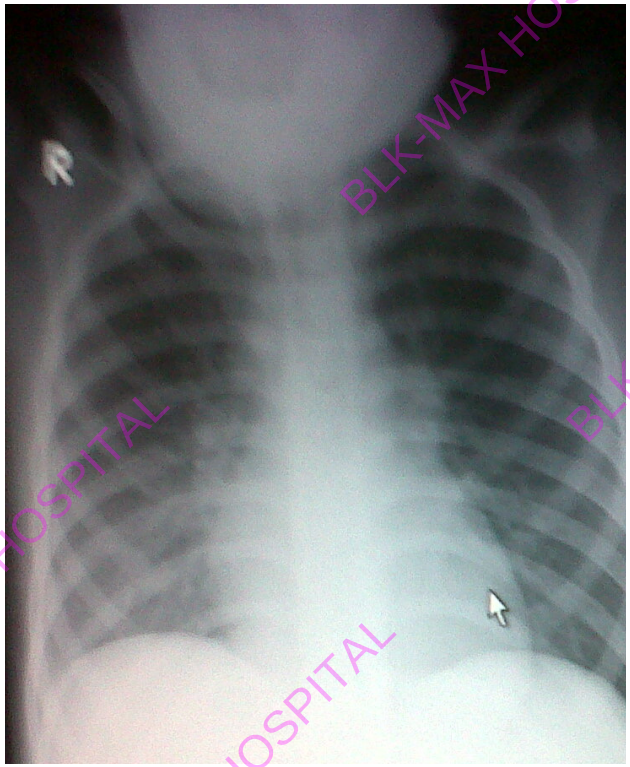
Case

- Child was invasively ventilated in view of poor GCS (6/15)

- RBS- 90mg/dl
- Chest X ray was normal.

- VBG - pH-7.0, pCO2- 25, Lactate- 1.5, HCO3- 6.8
  - Anion gap - 36.
- CBC- 12/15600 P60/ 2.2lac
- Urea/ Creat- 45/0.9
- LFT – Normal PT / APTT – normal
- CRP – 5mg/dl

- Functional 2D Echo – normal



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Possibilities

- No history of fever
- Altered sensorium
- Sepsis screen – negative
- LFT normal
- Urine ketones were +2.
- **Severe metabolic acidosis with high anion gap** and normal lactate

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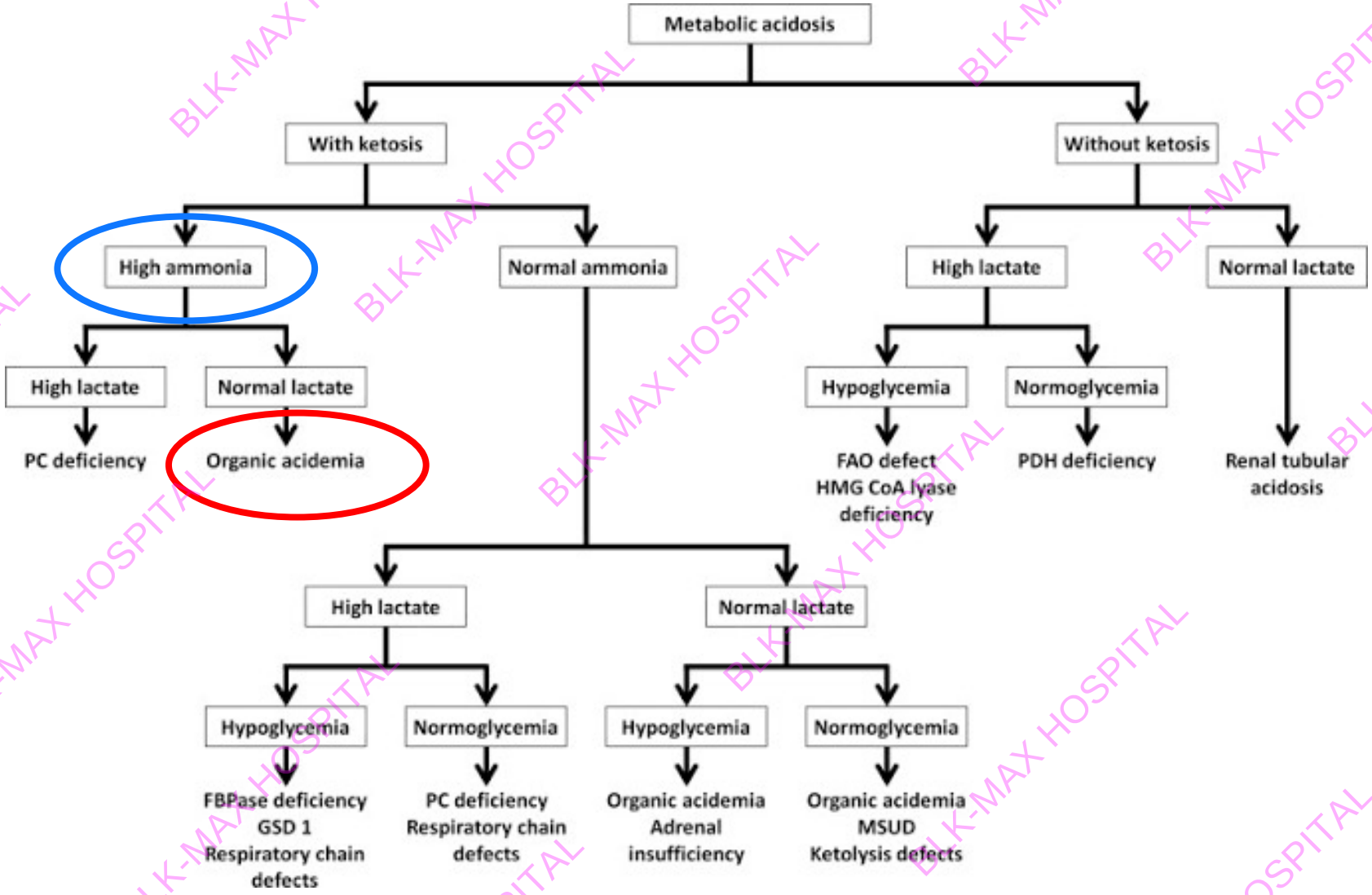
Metabolic disorder workup



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Case

- Metabolic disease was suspected
- **Serum ammonia – 694 ng/ml** (n < 100)
- **CRRT** was started.
- IV fluids with high GIR , avoiding high proteins and ammonia scavengers, special diet
- TMS, GCMS were sent
- Serum ammonia levels and acidosis gradually improved

- Child was extubated to room air by 48 hrs

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Take home message

- Every respiratory distress is not related to chest pathology
- Diagnostic evaluation of respiratory distress includes good history and physical Examination
- Diagnostic Work-up –blood gas analysis (arterial / venous) is very useful