Robotripping

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TWO CASES

- Case 1-
  - 19 year old male brought with giddiness followed by unconsciousness since 12 hours.
- Case 2-
  - 30 year old female brought with unconsciousness since 4 hours.

Immediate assessment and Intervention

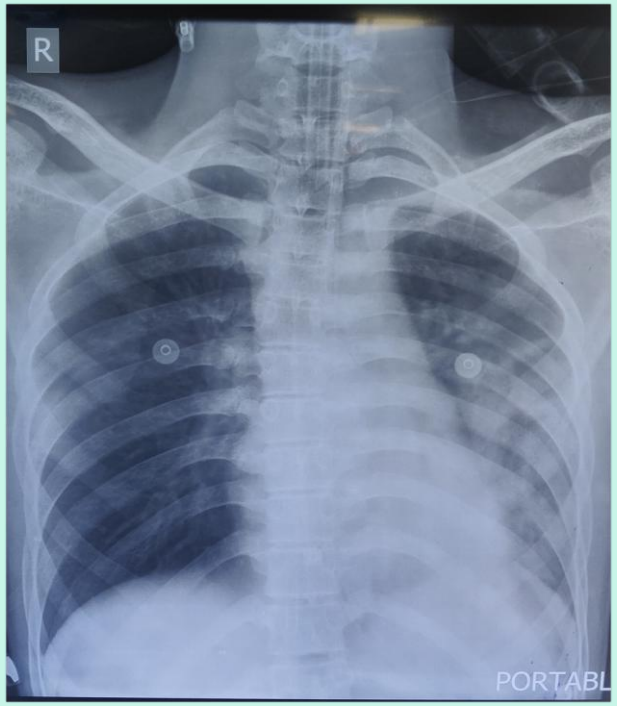
	Case 1	Case 2
Airway	Patent	Threatened
Intervention		Suction done and OPA was inserted
Breathing	-7 cycles per minute, Bilateral Rhonchi heard -With SpO2 of 76% on room air	-10 cycles per minute, Bilateral Rhonchi heard. -With SpO2 of 40% on room air
	Bag mask ventilation started	Bag mask ventilation started
Circulation	Pulse rate – 75bpm Blood pressure – 110/70mmHg CRT - <2sec	Pulse rate – 120bpm Blood pressure – 120/60mmHg CRT - <2sec

	Case 1	Case 2
Disability	GCS – 13/15 2mm pupils nonreactive to light BSL – 89mg/dl	GCS – 5/15 2mm pupils nonreactive to light BSL – 240mg/dl
Exposure	No scars, stains, Abrasions, Bite/fang marks.	Tattoos present, no scars/ abrasions, Bite/Fang marks.
Interventions	RSI intubation i/v/o persistent bradypnea and hypoxia.	RSI intubation i/v/o low GCS for airway protection.

Primary adjuncts

Case 1

- ECG – Normal sinus rhythm
- Xray chest – Left lung consolidation seen



Case 2

- ECG – Sinus tachycardia
- X ray chest – WNL

Arterial blood gasses

Case 1

- 60% FiO2
- pH – 7.09
- pCO2 – 66
- pO2 – 95
- K^+ - 6.6
- Bicarbonate – 20.3
- Type 2 respiratory failure with Hyperkalemia.

Case 2

- 60%FiO2
- pH – 7.272
- pCO2 – 70.1
- pO2 – 91.5
- K^+ - 3.5
- Bicarbonate – 21
- Type 2 respiratory failure.

Differentials

Case 1

- Occult neuroparalytic snake bite
- Toxidrome (opioid toxicity)
- ~~Seizure disorder~~
- Cerebrovascular accident
- Systemic infection- Pneumonia/Meningoencephalitis/
- Electrolyte imbalance

Case 2

- Cerebrovascular accident
- Metabolic encephalopathy
- ~~Traumatic brain injury~~
- Toxidrome (opioid toxicity)
- ~~Seizure disorder~~
- ~~Electrolyte imbalance~~
- Systemic infection - Meningitis

Lab investigations sent.

Immediate management

- Case 1 was treated with the following for hyperkalemia.
  - Inj. Calcium gluconate 20mg in 10cc NS infused over 10 minutes
  - Inj. D25% 100ml + Inj HAI 10 IU infusion IV stat.
  - Neb. Salbutamol 1-1-1-1.
  - Inj. Furosemide 20mg IV stat.
  - IVF NS/RL 500ml IV @ 60 ml/hr.
  - Inj. Amoxicillin-Clavulanic acid 1.2gm IV 1-0-1.
  - T. Azithromycin 500 mg PO 0-1-0.

Immediate management

- Case 2 received:
  - Inj. Ceftrioxone 1 gm IV 1-0-1.
  - IV Fluids NS/RL 500ml IV @ 60ml/hr.

Secondary survey

Case	1	2
Cardiovascular	S1S2 heard No audible murmurs	S1S2 heard No audible murmurs
Respiratory	B/l Rhonchi Left sided coarse crepititions +ve	B/l Rhonchi
Per abdomen	Soft nontender, No organomegaly	Soft nontender, No organomegaly
Central nervous	GCS 10t/15 2mm non reactive to light No FND, B/l plantar's mute.	GCS 5t/15 2mm non reactive to light No FND, B/l plantar's flexor.

Hustling for clues

Case 1	Case 2
Cough syrup abuse by the patient since few months. - Content – predominantly dextromethorphan	History of consuming excessive amounts of cough syrup when around her new acquaintance. - Content – predominantly Dextromethorphan

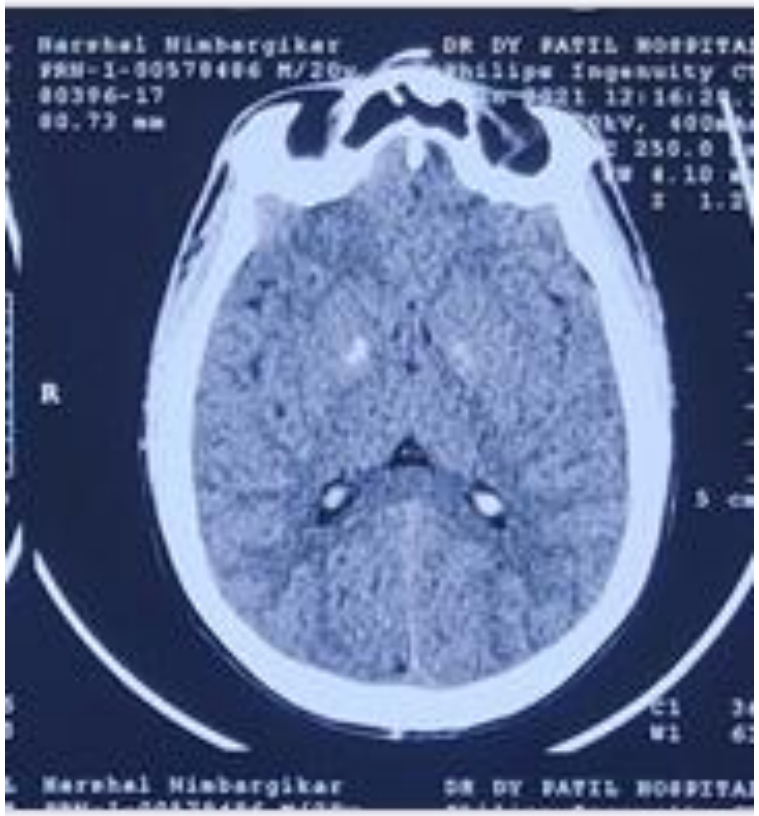
Lab Investigations

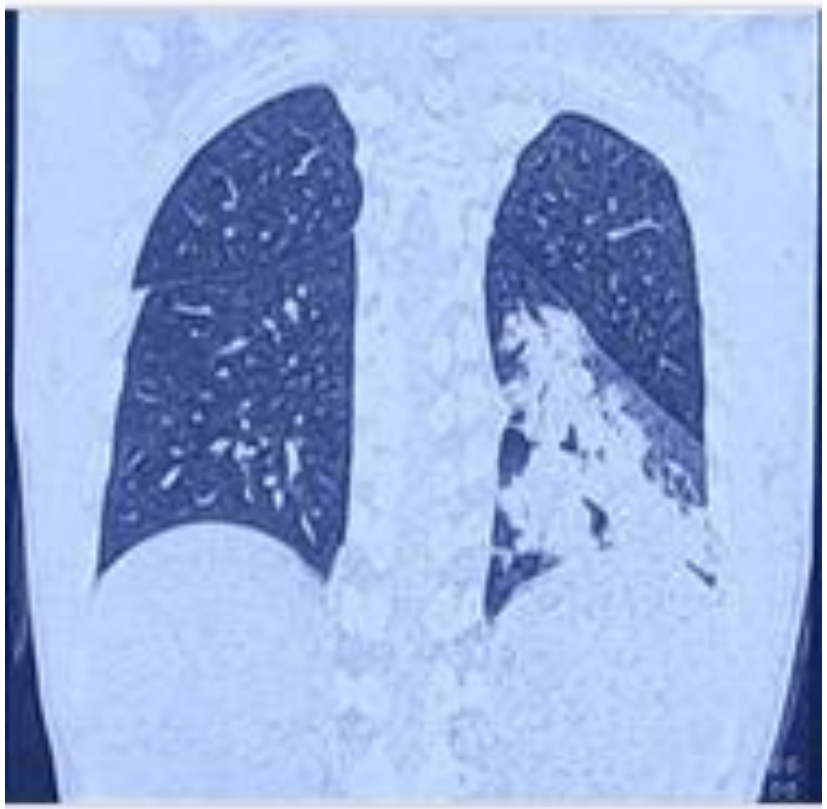
	Case 1	Case 2
CBC	Hb - 10 Tlc - 12,000 Plt - 2 lakh	Hb - 11 Tlc – 9,800 Plt – 1,32,000
RFT	Urea - 37 Creat – 1.75	Urea - 19 Creat – 0.94
Electrolytes	Na – 133 K – 6 CL - 104	Na – 140 K – 3.8 Cl - 108
LFT	T.B – 0.20 D.B – 0.16 I.B – 0.04 SGOT – 60 SGPT – 52 ALP - 90	T.B – 0.18 D.B – 0.18 I.B – 0.08 SGOT – 16 SGPT – 14 ALP - 61

Special Investigations

	Case 1	Case 2
D-Dimer	746ng/ml	166ng/ml
P. Cholinesterase level	7061 IU/L (N)	6644 IU/L (N)
Ammonia	----	127mg/dl

Male patients radiological investigations.





Radiological investigations

Female

- CT brain
  - Diffuse cerebral oedema.
- HRCT thorax
  - Post viral sequelae.

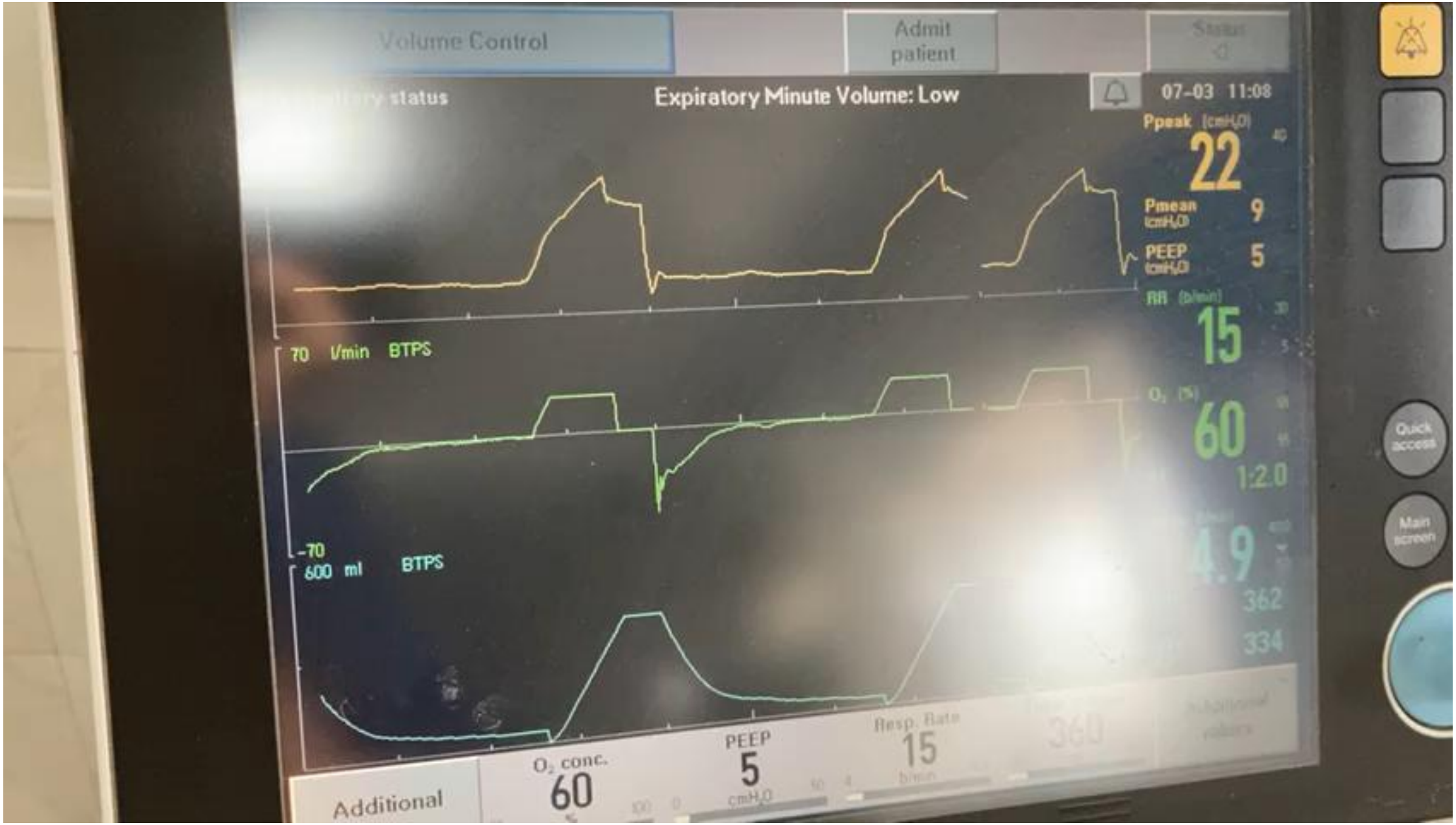
End point

- Summarising all the findings and ruling out various differentials,

- Opioid toxicity in the form of overdose from DXM was suspected.

Primary treatment

	Case 1	Case 2
Drug	Naloxone 400 mcg IV stat	Naloxone 400 mcg IV stat
Re-assessment	GCS – 10T/15	GCS-10T/15
	Increased respiratory rate value Pupillary size increased 2mm to 3-4mm	Increased respiratory rate Pupillary size increased 2mm to 3-4mm
Further Management	Intermittent boluses of Naloxone	Naloxone infusion


Volume Control
Admit patient
Expiratory Minute Volume: Low
07-03 11:08
Ppeak
22
Pmean
9
PEEP
5
RR
15
70 l/min BTPS
-70
600 ml BTPS
60
1:2.0
4.9
362
334
Quick access
Main screen
Additional
O2 conc.
60
PEEP
5
Resp. Rate
15

Discussion

- It is a methylated dextro-rotatory analogue of levorphanol which is a substance related to codeine and a non-opioid derivative of morphine.
- Classified as an acutely toxic drug that is legally available over the counter
- Prodrug metabolised to active metabolite - Dextrorphan.

Drug	μ	δ	κ	σ
Morphine	+++	+	+	-
DXM	-	-	-	++
Naloxone	Xxx	X	Xxx	-

- Mechanism of action of DXM
  - Sigma receptor blocker.
  - 5HT -1 antagonism.
  - NMDA receptor antagonist.

- Result of action of DXM – Cough suppression.

- ***Therapeutic doses 90mg per day divided over three doses i.e. 30mg 1-1-1***

- At specific dosages of DXM,
  - 100 to 200mg – Mild stimulation and Euphoria.
  - 200 to 400mg – Effects similar to alcohol intoxication.
  - 400 to 600mg – Effects similar to dissociation produced by ketamine.
  - 1000mg - Respiratory depression and coma
  - 500 to 1,500mg – Effects similar to Phencyclidine i.e. hallucinations, delirium, Out of body experience’s.

Practical Implications

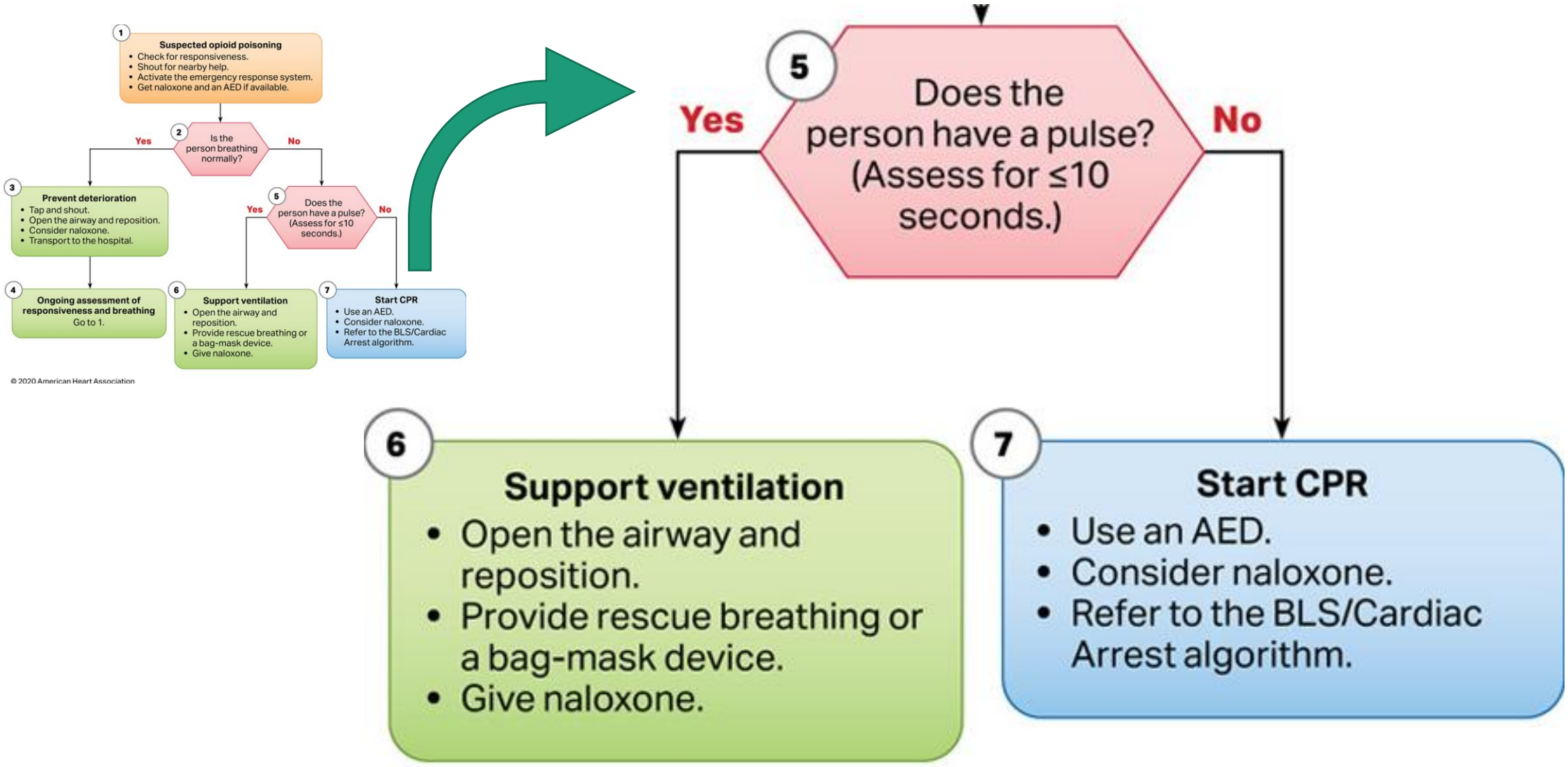
Contains 10mg per 2 ml i.e. 500mg per bottle

- The Surge in DXM abuse, a brief note
  - DXM is a legal high.
  - Readily available in pharmacy as an over the counter medication.
  - Multiple socio-economic factors play into its abuse
    - Poverty
    - Privatisation of healthcare
    - Alternative
    - Corruption
    - Cultural appropriation

- DXM abuse has reached pandemic proportions.
  - USA has experienced DXM abuse ever since its introduction from the 1950's[1].
  - Neighbouring countries have seen similar case reports[2].
  - Southeast asia[3].
  - India[4].

1 - Caffrey CR, Lank PM. When good times go bad: managing 'legal high' complications in the emergency department. *Open Access Emerg Med*. 2017;10:9-23. Published 2017 Dec 20. doi:10.2147/OAEM.S120120
2 – Humera Shafi, Muhammad Imran, Hafiz Faisal Usman, Muhammad Sarwar, Muhammad Ashraf Tahir, Rabia Naveed, Muhammad Zar Ashiq, Ammar M. Tahir,Deaths due to abuse of dextromethorphan sold over-the-counter in Pakistan,Egyptian Journal of Forensic Sciences,Volume 6, Issue 3,2016,Pages 280-283,
3 - Manaboriboon B, Chomchai C. Dextromethorphan abuse in Thai adolescents: A report of two cases and review of literature. J Med Assoc Thai. 2005 Nov;88 Suppl 8:S242-5. PMID: 16856446.
4 - Kaur, Navnnet & Mahajan, & Pal Singh Batra, Arvinder & Khurana,. (2010). Dextromethorphan Abuse- A rising Menace in India- case review and its Toxicokinetics.. Anil Aggrawal's Internet Journal of Forensic Medicine and Toxicology. 8. 122-27.

- ACLS guidelines for acute opioid toxicity (2020)



- Naloxone, pure opioid antagonist
- Duration of action – 1 to 2 hours.
- 0.04 mg IV in spontaneous breathing patients with chronic opioid abuse.
- 0.4 mg IV in spontaneous breathing patients with opioid naïve status.
- 2 mg IV STAT in patients with apnea and cynosis.
- Adverse effects - Allergic reaction to the medication.

Findings pertaining to the cases at hand

- Cerebral oedema as a finding of CO2 narcosis was documented in a case of isolated type 2 respiratory failure in asthmatics[1].
- B/l cerebral haemorrhaging of the globus pallidus was documented in cases of chronic opioid abuse[2].

1 – Roh D, Merkler AE, Al-Mufti F, et al. Global cerebral edema from hypercapnic respiratory acidosis and response to hyperosmolar therapy. *Neurology*. 2016;86(16):1556-1558.
2 - Alquist CR, McGoey R, Bastian F, Newman W 3rd. Bilateral globus pallidus lesions. J La State Med Soc. 2012 May-Jun;164(3):145-6. PMID: 22866355.

Teaching points

- Beware and be alert about the abuse potential of Over the Counter medications.
- Unclear history and alarming clinical picture → Evaluate for drug toxicity.
- A trial of Naloxone is ideal for patients with suspected opioid toxicity.


THANK YOU