

Forenames
Last name
Hospital No
D.O.B.

NITROUS OXIDE TOXICITY PATHWAY

First Presentation: ED or Medical SDEC (Day 0)

Patient presenting with neurological abnormalities and a history of recreational Nitrous Oxide (N₂O) use

Document N₂O use quantity
Neurological examination (use proforma overleaf)

Consider alternative diagnosis if:

- ☐ Vision changes
- ☐ Recent infective illness
- ☐ Back pain
- ☐ Ascending symptoms
- ☐ Labile BP
- ☐ Tachycardia / arrhythmia

Red Flags:

- ☐ Immunosuppression
- ☐ History of cancer
- ☐ Fever
- ☐ Features of cauda equina syndrome

Investigations:

- FBC/U&E/LFT/TFT/B12/Folate/HIV/syphilis
- Send sample for storage (Separate Red EDTA)
- Homocysteine*
- Request urgent outpatient MRI Cervical & Thoracic spine

*Measure only if B12 in normal range. Send as add on request for storage sample. (Result may take days & will be reviewed in RANA/SDEC follow-up)

Treatment

Hydroxycobalamin 1mg IM STAT

Patient Education:

1. Stop using N₂O immediately for B12 injections to work. Continued use may lead to irreversible worsening of their neurological function.
2. Stress importance of attending follow up injections and clinic reviews.
3. Provide RCEM PIL and signpost to local SMLT services

Discharge & Follow-Up

1. Call 1B mSDEC co-ordinator to arrange follow up on Medical SDEC in 2 days.
2. Clear safety netting to return if deterioration in symptoms

Admit

Refer for admission if patient is newly unable to self-care

Review on Medical SDEC (Day 2)

Review:

- Repeat full neurological examination
- Ensure patient is abstaining from N₂O use
- Review MRI report and Homocysteine result if available

Discuss with AMU Consultant or on call Neurologist if concerns about a possible alternate diagnosis

Refer to Rapid Access Neurology Assessment clinic at Walton Centre (<http://rana.walton.wiki/>); document in notes
Ensure arrangements in place for ongoing B12 injections on 1B mSDEC for 2 weeks (Mon/Wed/Fri)

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Gait description (Do they require walking aids?):

Romberg's test:

Time for ten metre walk test:

Note that findings are generally symmetrical in N₂O-SACD

Right side:

Joint position sense loss to:

UL: LL:

Pinprick sensory loss to:

UL: LL:

Power (MRC flex/extend 0-5):

Hip f: e: Shoulder - f: e:

Knee f: e: Elbow - f: e:

Foot d: p: Grasp -

Reflexes (0 to ++++):

Biceps: Knee: Ankle:

Plantar:

Left side:

Joint position sense loss to:

UL: LL:

Pinprick sensory loss to:

UL: LL:

Power (MRC flex/extend 0-5):

Hip -f: e: Shoulder -f: e:

Knee -f: e: Elbow -f: e:

Foot -d: p: Grasp -

Reflexes (0 to ++++):

Biceps: Knee: Ankle:

Plantar:

Other possible findings in N₂O-SACD

Lhermitte's:

Pseudo-athetosis:

Psychiatric disturbance:

Vision change:

Bowel and bladder disturbances (do they need a bladder scan?):

Association of British Neurologists Clinical Practice Guide: Nitrous Oxide-Induced Subacute Combined Degeneration of the Cord 12/2/2023

Use above proforma to standardise the review of neurology on Day 0, Day 2 and on any subsequent days when patient presents to mSDEC for B12 injections if patients states their neurology has worsened