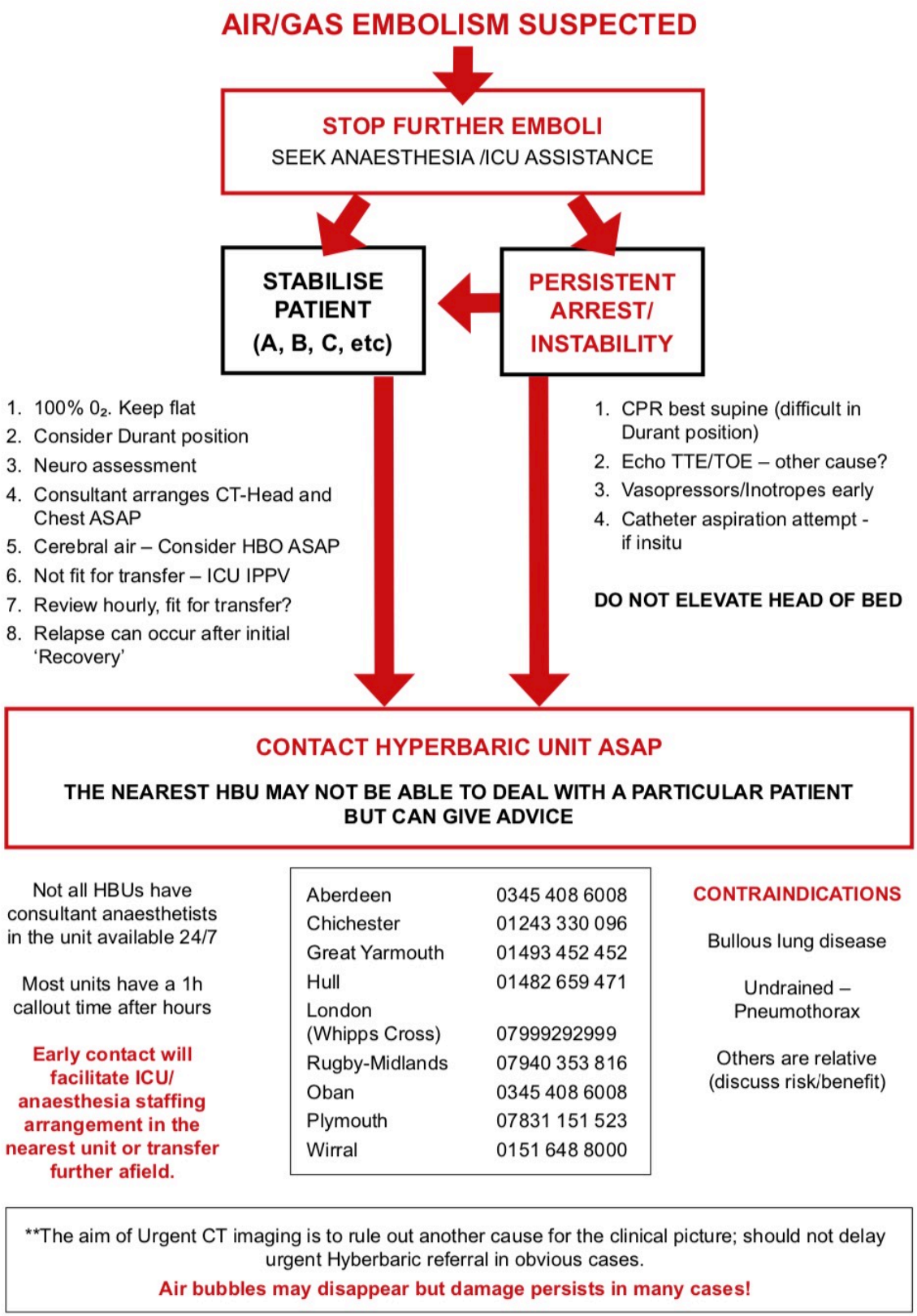
# Major Air / Gas Embolism Guideline

**Prevention is better than cure – Meticulous care during device insertion, use & removal**
**PLEASE SEE GUIDELINE ON CVC REMOVAL**

## Summary flowchart of approach to suspected gas embolism:




Not all HBUs have consultant anaesthetists in the unit available 24/7

Most units have a 1h callout time after hours

**Early contact will facilitate ICU/ anaesthesia staffing arrangement in the nearest unit or transfer further afield.**

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|---|---|
| Aberdeen | 0345 408 6008 |
| Chichester | 01243 330 096 |
| Great Yarmouth | 01493 452 452 |
| Hull | 01482 659 471 |
| London (Whipps Cross) | 07999292999 |
| Rugby-Midlands | 07940 353 816 |
| Oban | 0345 408 6008 |
| Plymouth | 07831 151 523 |
| Wirral | 0151 648 8000 |

**CONTRAINDICATIONS**

Bullous lung disease

Undrained – Pneumothorax

Others are relative (discuss risk/benefit)

**The aim of Urgent CT imaging is to rule out another cause for the clinical picture; should not delay urgent Hyberbaric referral in obvious cases.

**Air bubbles may disappear but damage persists in many cases!**

*Extract from ICS Management of Patients With Gas Embolism 2019*

**Procedures at risk of gas embolism**

- **Vascular access devices**; ***insertion, use & removal*** (CVC, IABP rupture)
- **Diagnostic procedures;** (Thoracocentesis, LP, arterial angiography)
- **Surgical procedures;** (Neuro, Head & Neck, Cardiothoracic, Vascular, Laparoscopic, C-Section, Orthopaedic)
- **Trauma;** chest trauma, blast injury, DCI (diving incidents)

**Major air embolism – Probably >0.5ml/kg**

**Symptoms and Signs**

- Desaturation, wheezing, breathlessness
- Hypotension, chest pain, heart failure, cardiovascular collapse
- Altered mental status, cerebral embolism

**Management of suspected or confirmed air/gas embolism**

1. **Stop air/gas entrainment**
2. **Provide high flow oxygen (15lpm via non-rebreather mask with reservoir if spontaneous ventilating, or 100% oxygen if ventilated)**
3. **Lie patient in left lateral and head down position if possible**
4. **Continuous monitoring of ECG, BP and oxygen saturations**
5. **Call for senior medical attendance**
6. **Consider aspiration of right sided gas via existing central venous access**
7. **If signs of haemodynamic or respiratory compromise call ITU**
8. **Call 2222 if peri-arrest / cardiac or respiratory arrest and commence normal CPR protocol**
9. **Consider urgent CT Head and Chest and TTE/TOE**
10. **Consider Hyperbaric Oxygen Therapy Unit referral – Aberdeen 0345 408 6008**
11. **If normal physiology and well for 60mins, wean $O_2$ and allow patient back to normal position**

**Reference**

1. Mirski MA, Lele AV, Fitzsimmons L, Toung TJK. Diagnosis and treatment of vascular air embolism. Anesthesiology. 2007Jan.;106(1):164–77.
2. https://www.ics.ac.uk/ICS/ICS/GuidelinesAndStandards/ICSGuidelines.aspx

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| **Title**: Major Air / Gas Embolism Guideline | |
| **ID:** MAGEG261012v4 | **Authors:** Dr M Dunn |
| **Category:** Cardiovascular | **Document Version:** 3 |
| **Status Draft/Final:** Final | **Review Date:** Sept 2021 |
| **Authoriser:** QIT | **Date Authorisation:** 2103, 2015, Apr 2019, Sept 2019 |