

# Appendix 1: Hypocalcaemia

## Definition:

Adjusted Calcium ( $\text{Ca}^{2+}$ ) less than 2.2mmol/l

## Symptoms:

Typically occur when adjusted Calcium less than 1.9 mmol/l, but depends on speed of fall, among other factors. Commonly:

- Perioral and digital paraesthesia
- Tetany and carpo-pedal spasm
- ECG changes- prolonged QT interval and arrhythmias
- Seizures
- Laryngospasm
- Positive Trousseau's sign (carpopedal spasm when BP cuff inflated above systolic BP)

## Causes:

- Disruption of parathyroid gland function after thyroidectomy: common, sometimes transient, usually acute presentation.
- Parathyroid surgery/ hypoparathyroidism
- Severe vitamin D deficiency: due to poor diet/malabsorption/insufficient sunlight/renal disease/liver disease
- Magnesium deficiency, including PPI- induced
- Cytotoxic drugs
- Rarer: pancreatitis, rhabdomyolysis, rapid transfusion

## Investigation: (if hospital admission not indicated):

- Serum adjusted calcium
- Serum phosphate
- Parathyroid hormone
- Urea and electrolytes
- Vitamin D
- Magnesium (Mg)

## Management

### Severe hypocalcaemia: $\text{Ca}^{2+} < 1.9\text{mmol/l}$ , or symptomatic at any level below normal range: This is a medical emergency

Urgent admission for hospital treatment with IV calcium gluconate.

### Mild/moderate hypocalcaemia: $\text{Ca}^{2+} = 1.9\text{-}2.2\text{mmol/l}$ and asymptomatic

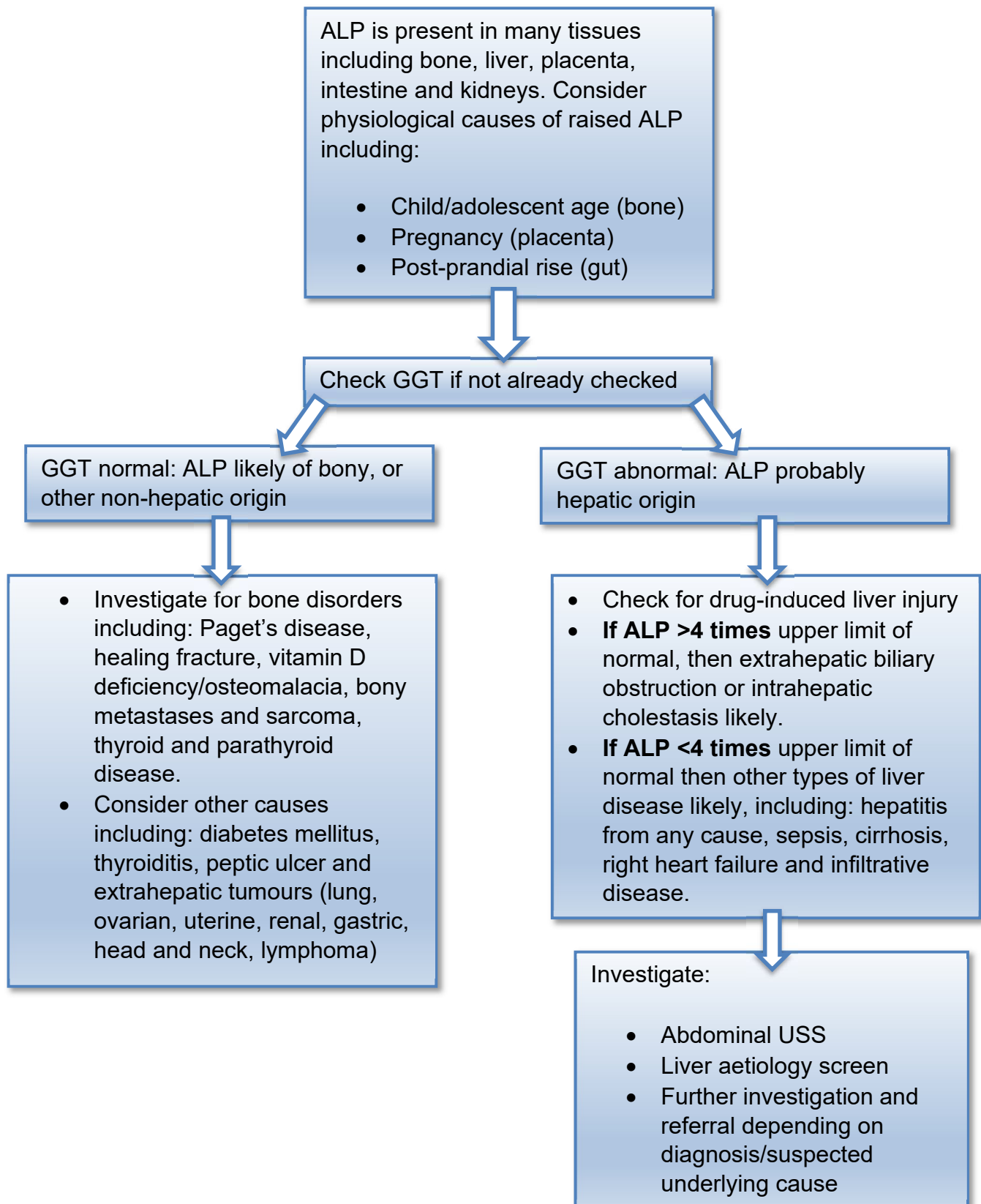
- Post-operative cases: seek specialist advice.
- Start oral calcium supplement (eg Calvive 1000, 2 tabs bd/ Adcal D3 3 tabs bd).
- If vitamin D deficient (*low vit D, raised PTH*):
  - Seek specialist advice if: underlying condition predisposing to hypercalcaemia; malabsorption; renal calculi; severe renal or hepatic disease; pregnancy.
  - If none of these apply, prescribe loading dose of vit D as per local guideline, then maintenance dose thereafter. Recheck calcium levels.
- Hypoparathyroidism (*low PTH is virtually diagnostic*). Refer to endocrinology.

## Appendix 1: Continued

- Hypomagnesaemia (*PTH often normal*): stop any precipitating drug. Hypocalcaemia will be resistant to treatment unless Mg level corrected. If asymptomatic and serum level 0.3-0.7: treat with oral magnesium as per BNF. If symptomatic or serum level <0.3: IV magnesium in hospital.
- Other causes: treat underlying condition, consult oncology if recent cytotoxic drugs.
- If no obvious cause, refer to endocrinology.

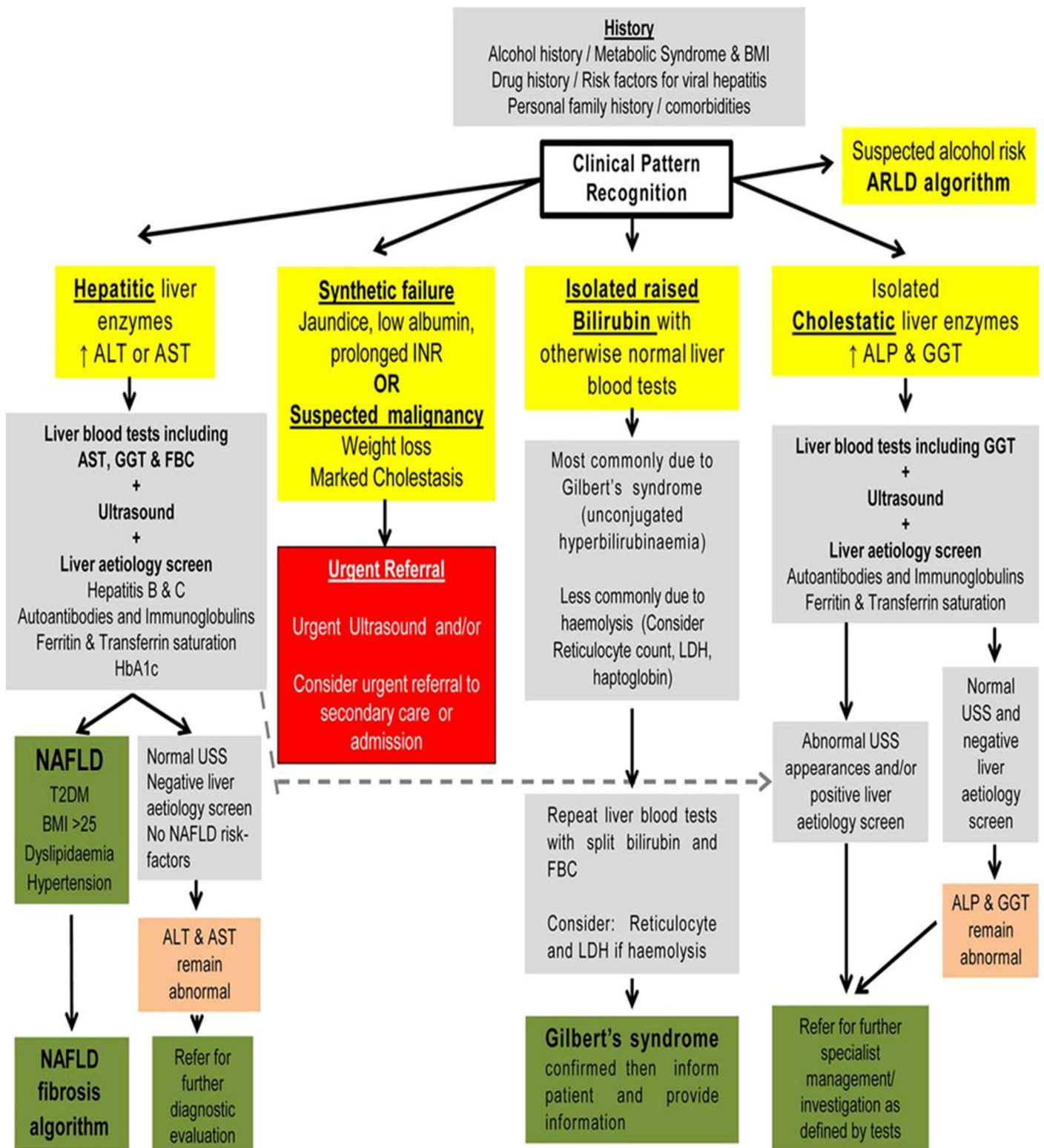
Sources : Turner J, Gittoes N, Selby P. Society for endocrinology emergency endocrine guidance: emergency management of acute hypocalcaemia in adult patients. Endocrine connections. 2019 Jun 1;8(6):X1 and NICE CKS Vitamin D Deficiency in Adults: <https://cks.nice.org.uk/topics/vitamin-d-deficiency-in-adults/> and BNF 2022.

## Appendix 2: Investigating an isolated rise in alkaline phosphatase (ALP)



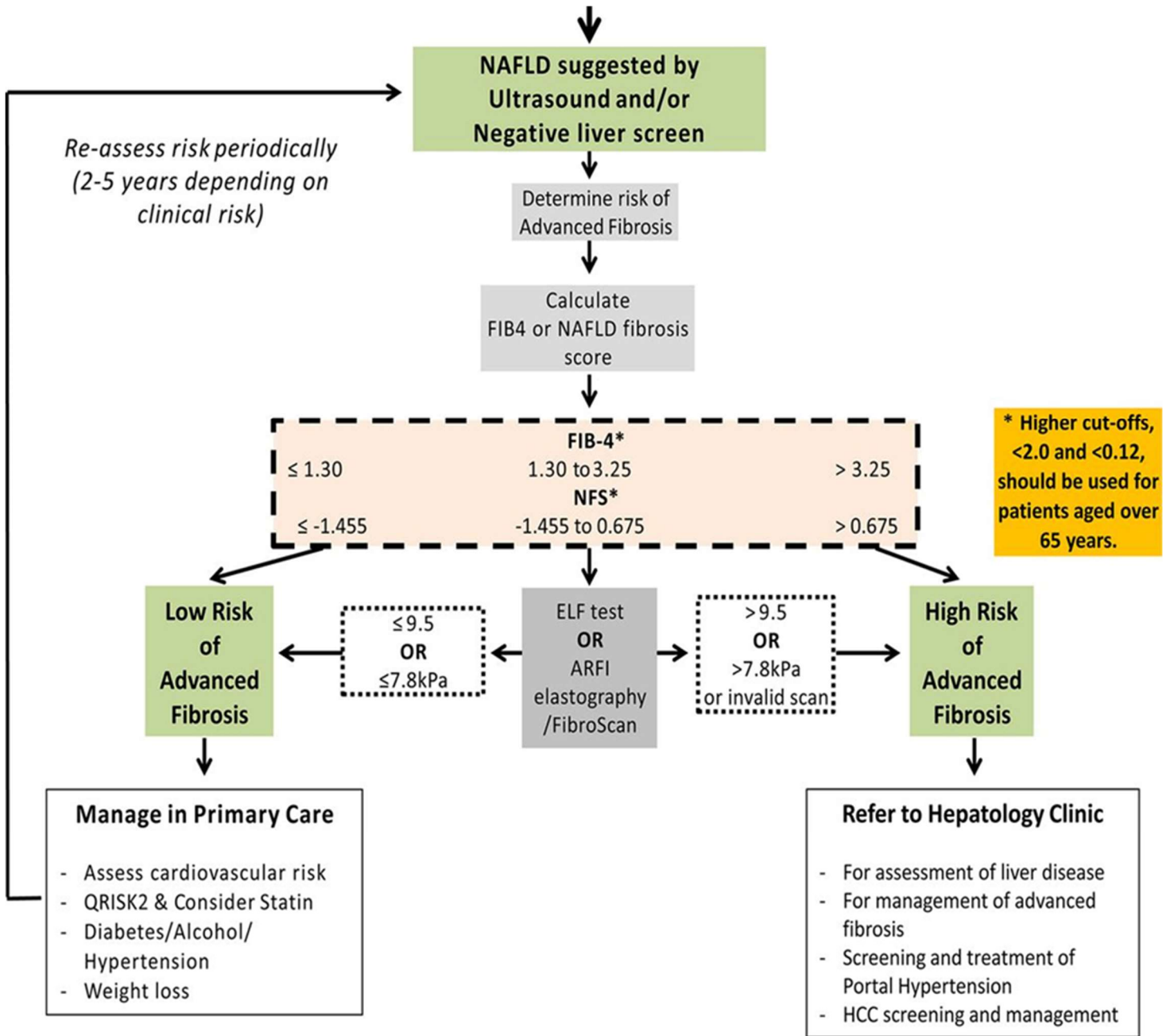
Source: Lowe D, Sanvictores T, Zubair M, John S. Alkaline phosphatase. StatPearls. 2022 Nov 4. <https://www.statpearls.com/articlelibrary/viewarticle/17359/> and Newsome PN, Cramb R and Davidson SM et al. British Society for Gastroenterology. Guidelines on management of abnormal liver blood tests. Website. <https://www.bsg.org.uk/clinical-resource/guidelines-on-the-management-of-abnormal-liver-blood-tests/> 9<sup>th</sup> Dec 2021

### Appendix 3: Abnormal liver blood tests flowchart<sup>12</sup> (with permission under Creative Commons)



Source: 12. Newsome PN, Cramb R and Davidson SM et al. British Society for Gastroenterology. Guidelines on management of abnormal liver blood tests. Website. <https://www.bsg.org.uk/clinical-resource/guidelines-on-the-management-of-abnormal-liver-blood-tests/> 9<sup>th</sup> Dec 2021

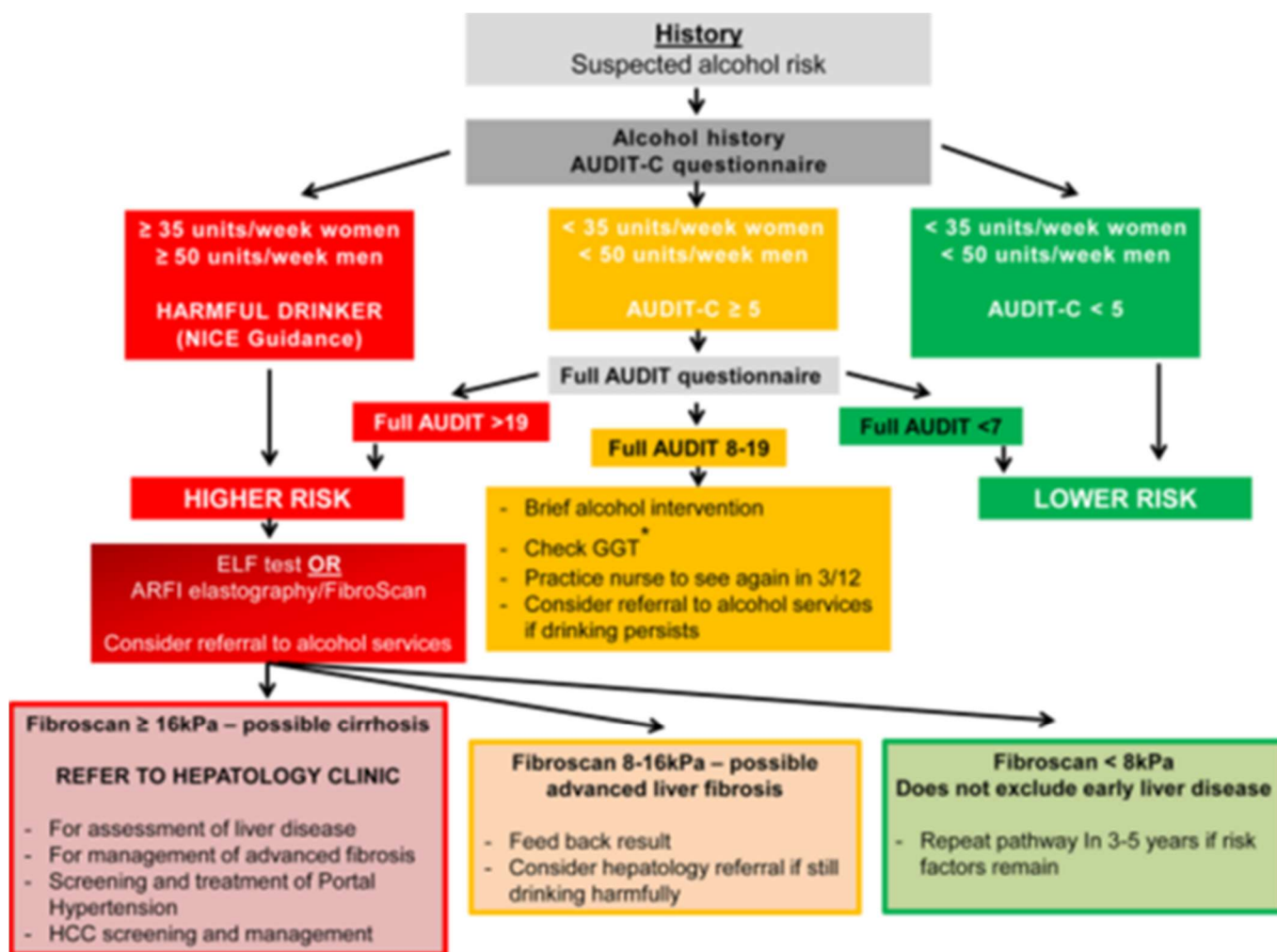
**Appendix 4: Suspected NAFLD flowchart<sup>12</sup>**  
(with permission under Creative Commons)



- Fib 4 = Fibrosis 4 Score. (See [Info Point 31](#))
- NFS = NAFLD Fibrosis Score
- ELF = Enhanced Liver Fibrosis
- ARFI elastography = Acoustic Radiation Force Impulse

Source: 12. Newsome PN, Cramb R and Davidson SM et al. British Society for Gastroenterology. Guidelines on management of abnormal liver blood tests. Website. <https://www.bsg.org.uk/clinical-resource/guidelines-on-the-management-of-abnormal-liver-blood-tests/> 9<sup>th</sup> Dec 2021

## Appendix 5: Suspected alcohol-related liver disease (ALD) flowchart<sup>12</sup> (with permission under Creative Commons)

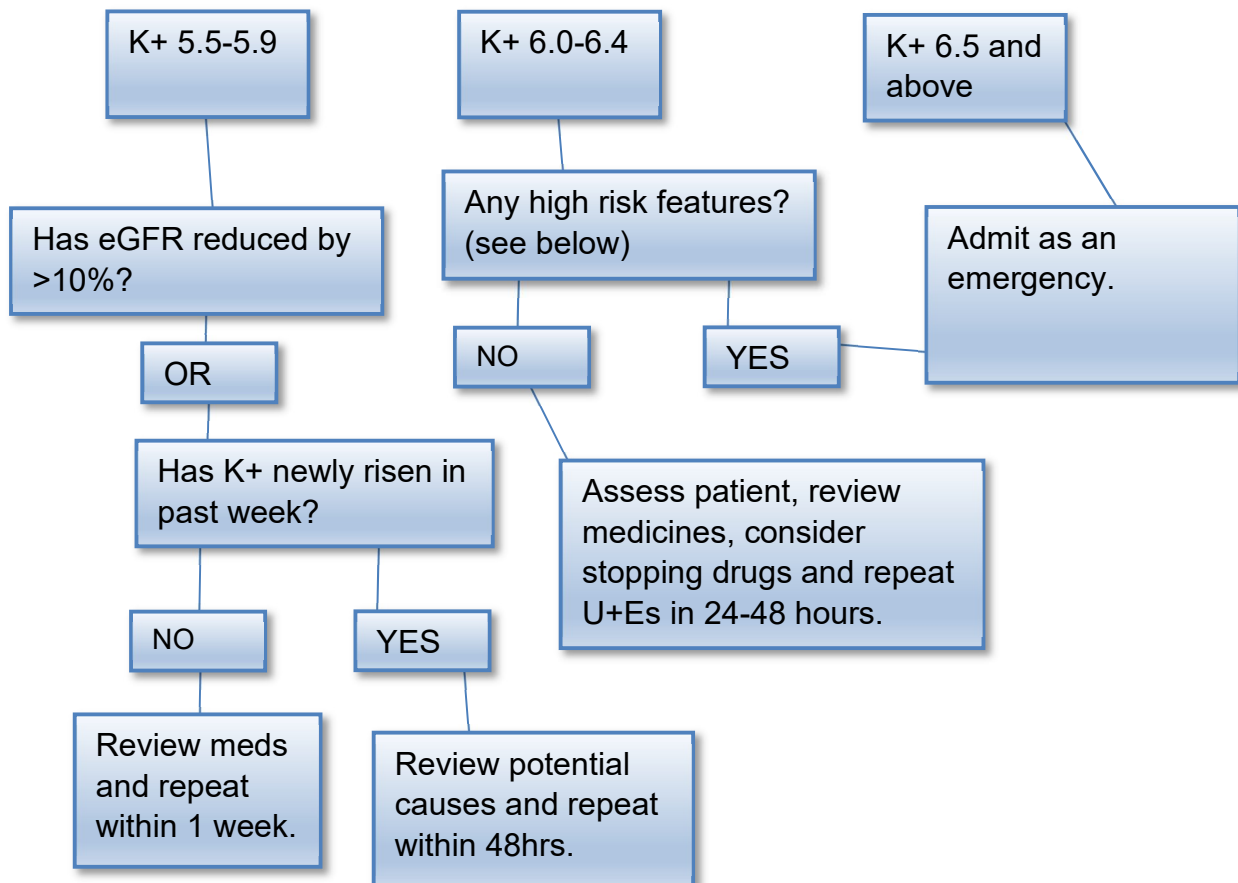


\* If GGT>100U/L and continuing harmful drinking then consider Hepatology referral even if low risk Fibroscan

- ELF = Enhanced Liver Fibrosis serum marker
- ARFI elastography = Acoustic Radiation Force Impulse scan

Source: 12.Newsome PN, Cramb R and Davidson SM et al. British Society for Gastroenterology. Guidelines on management of abnormal liver blood tests. Website. <https://www.bsg.org.uk/clinical-resource/guidelines-on-the-management-of-abnormal-liver-blood-tests/> 9<sup>th</sup> Dec 2021

## Appendix 6: Management of Hyperkalaemia in the community



### High Risk features:

- ECG changes
- Fall in eGFR >10ml/min
- Fall in eGFR >25% since last test
- AKI
- Bicarbonate <16 mmol/l
- New eGFR <45 ml/min