



# The clinical factors most likely to result in an abnormal CT Head – a UK trauma centre experience

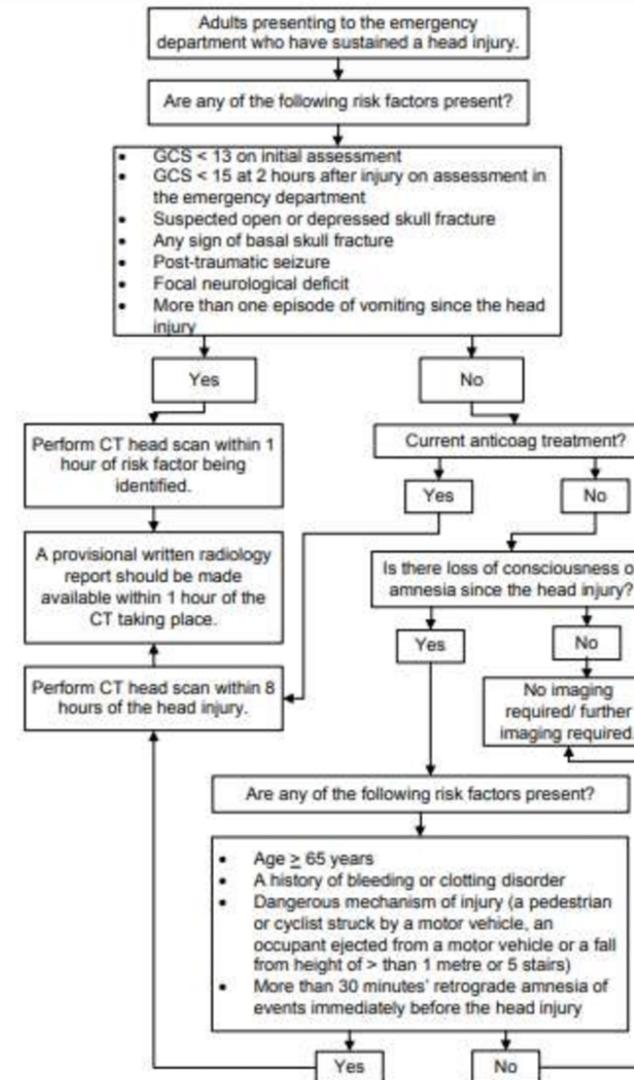
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# Background - What are the NICE Guidelines?

- Set of parameters used to identify if a patient presenting with head injury warrants an urgent CT Head

*(Urgent = CT scan performed and reported within 1 hour of identifying the head injury)*

- Published in 2014
- Developed from the Canadian CT Head Rule (2001)
- Strong evidence base encourages adherence



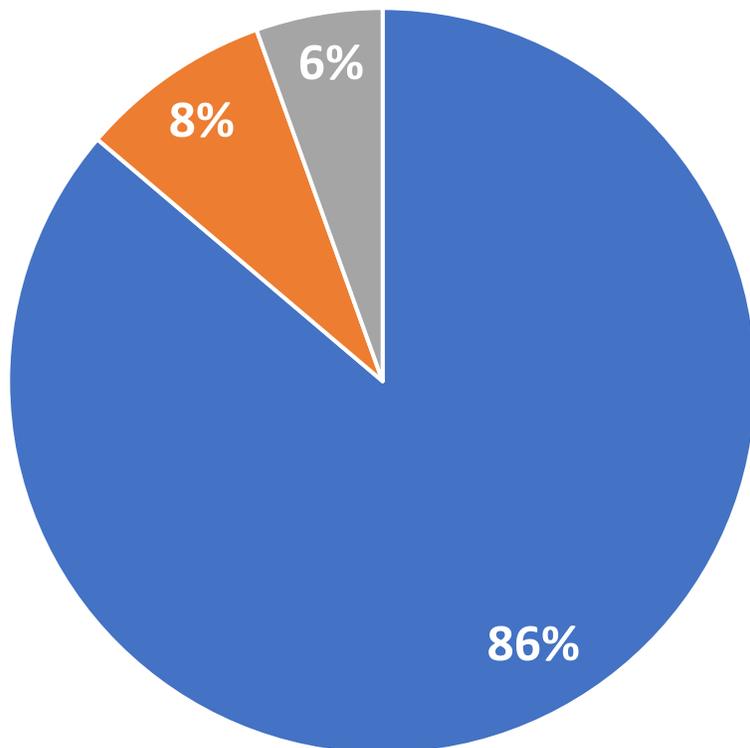
NICE  
Guidelines  
Flow Chart  
for Acute  
Head Injury

# Methods

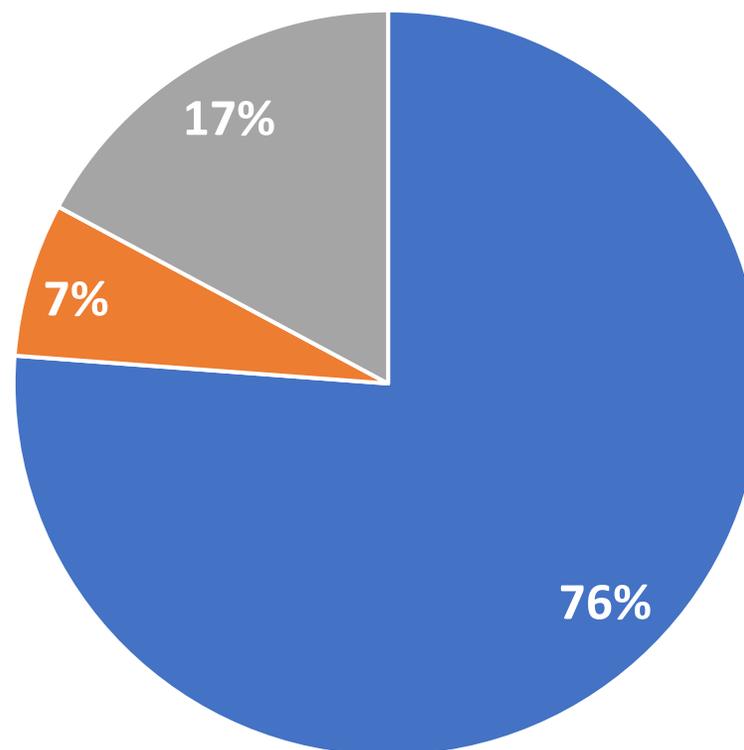
- Retrospective data collection over 4 months
- 15 Oct 2021 – 15 Jan 2022
- Identified all Acute CT Heads in ED that used the local ‘head injury’ proforma (n=1542)
- Analysed clinical history for GCS and other factors (as per NICE)
- Also analysed proportion of intracranial(IC)/extracranial(EC) injuries and correlation with clinical factors

# Why GCS is an important factor

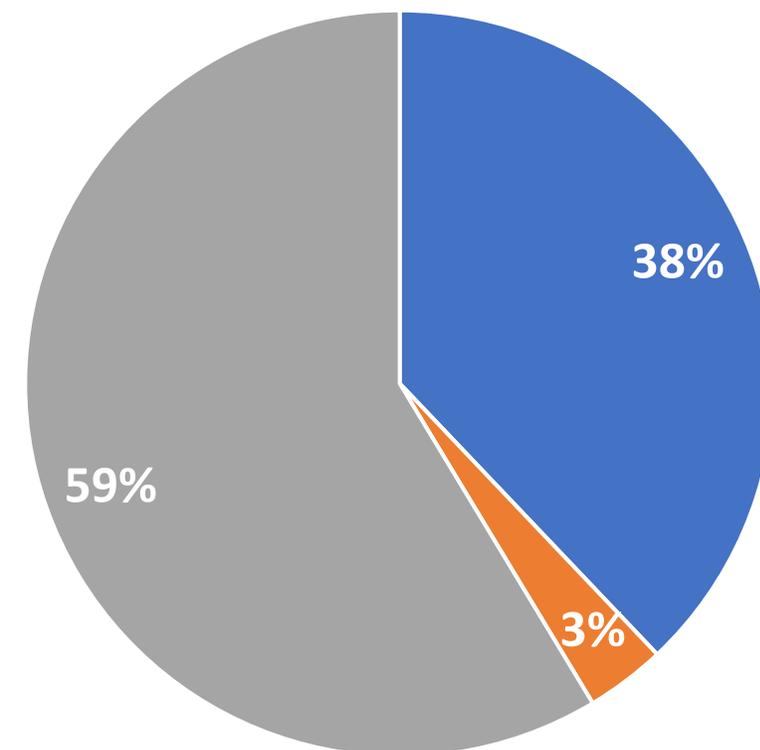
GCS >13 (n = 1408)



GCS 9 - 13 (n = 105)



GCS <9 (n = 29)



■ Normal    ■ Extracranial injuries only    ■ All Intracranial Injuries

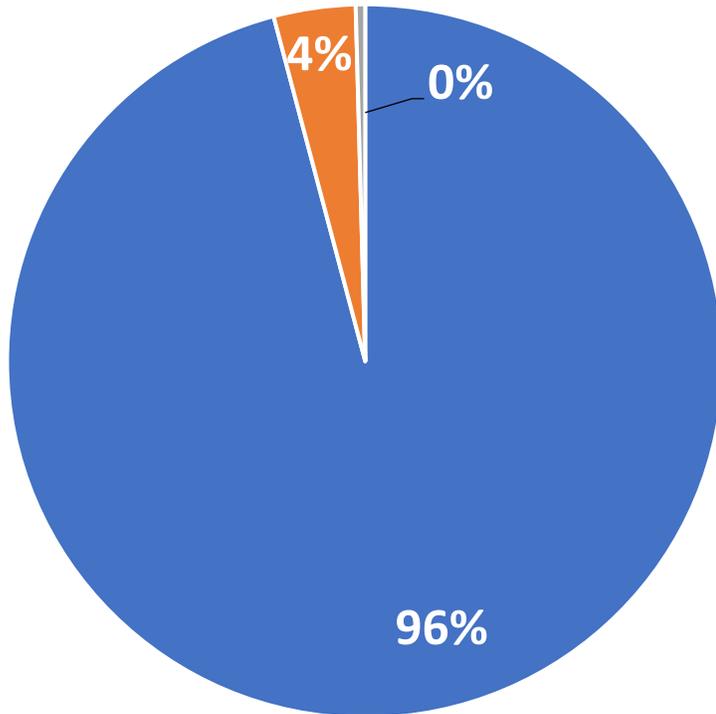
\* Chi Square testing showed a significant correlation between GCS and abnormal findings

# Grading IC Injury – Rotterdam Score

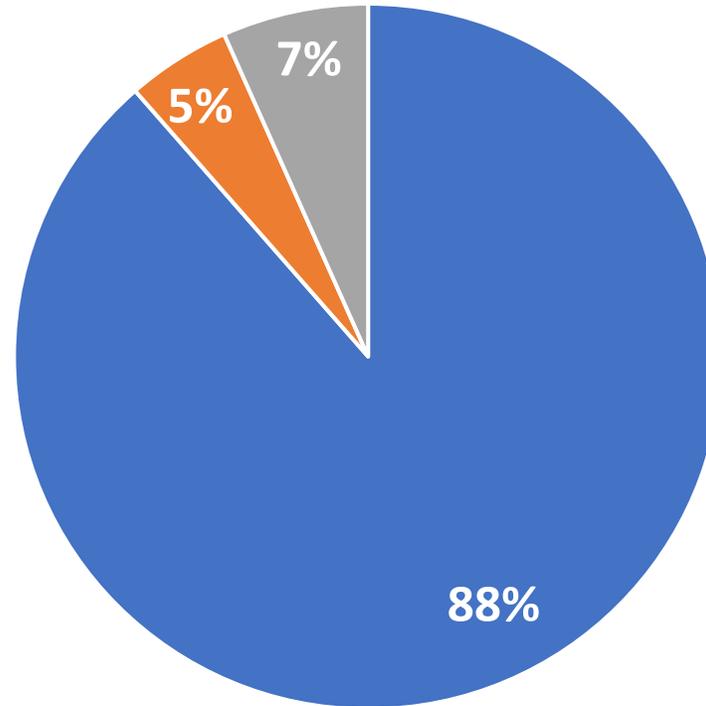
- Published in 2006
- 4 components assessed
- Total score between 1 – 6
- Predictor of 6-month mortality
  - (0% for Score of 1, 61% for Score of 6)

# Relationship of GCS with Rotterdam Score

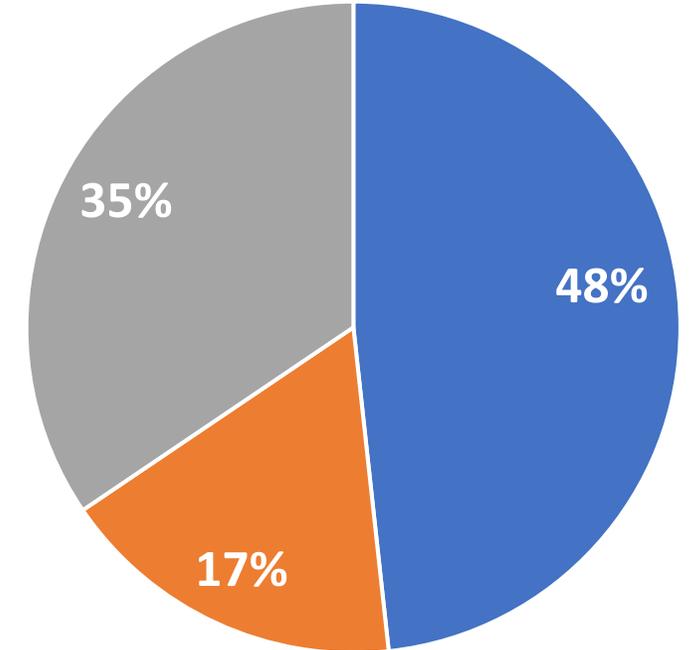
GCS >13 (n=1408)



GCS 9 – 13 (n = 105)



GCS <9 (n = 29)

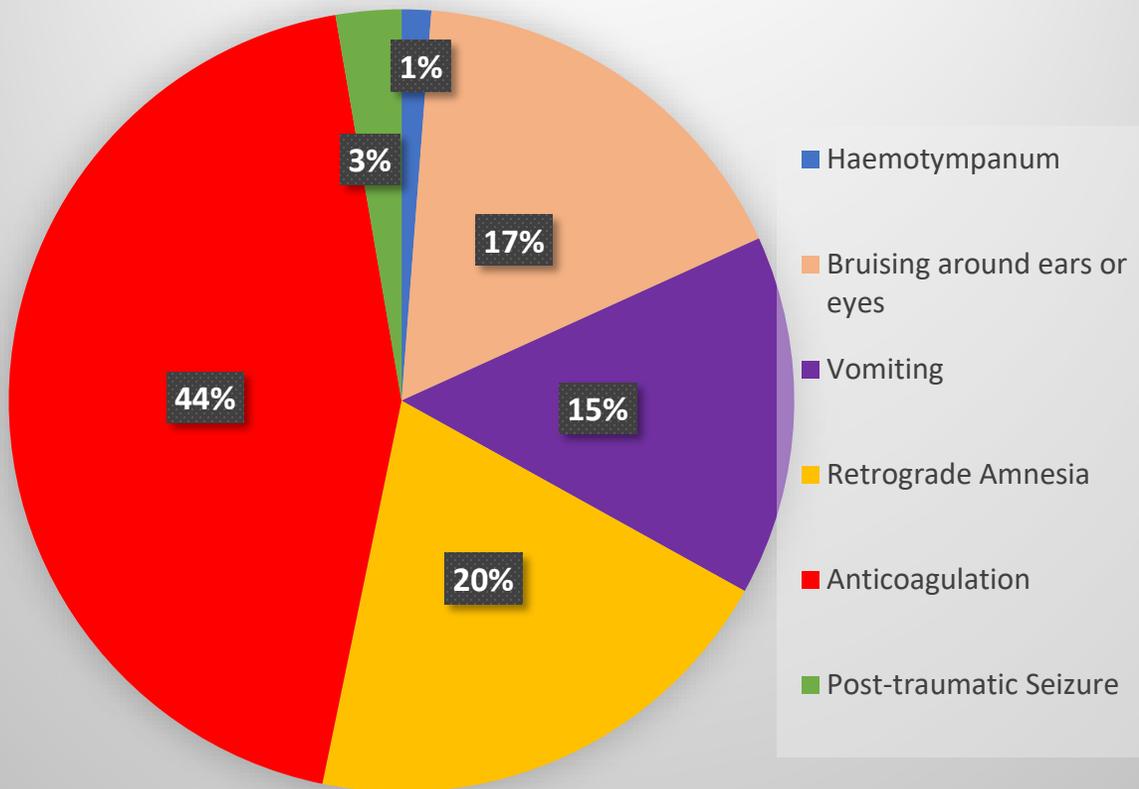


■ Rotterdam 1 (Mortality 0%)    ■ Rotterdam 2-3 (Mortality 7-16%)    ■ Rotterdam 4-6 (Mortality 26 - 61%)

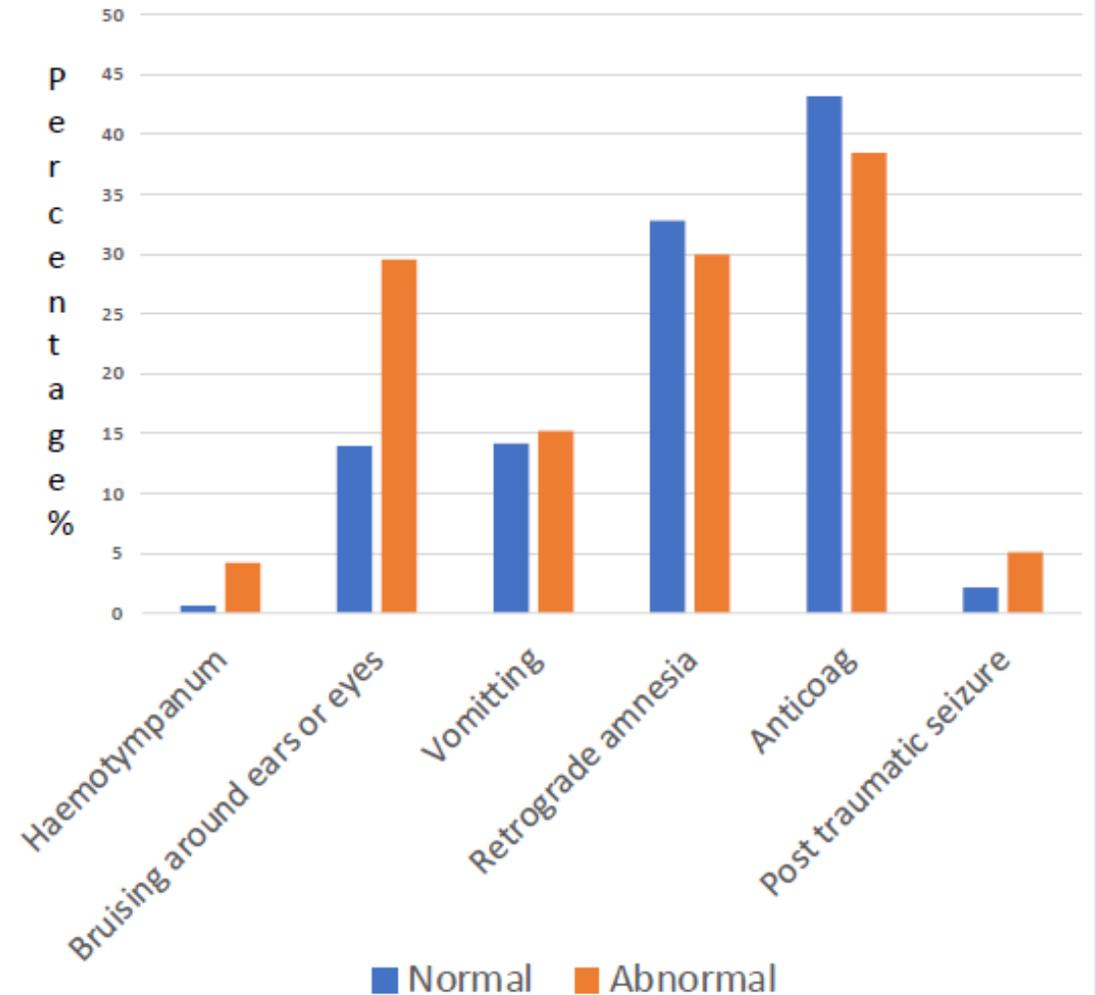
\* Chi Square testing showed a significant correlation between GCS and Rotterdam Score

# Other Clinical Factors

Most common indication for Imaging



Normal vs Abnormal Breakdown of the different clinical indications



# Results

	Normal		Abnormal		P<0.05
	n	%	n	%	
Haemotympanum	8	0.61	10	4.22	✓
Bruising around ears or eyes	182	13.95	70	29.54	✓
Vomitting	185	14.18	36	15.19	✗
Retrograde amnesia	428	32.80	71	29.96	✗
Anticoag	563	43.14	91	38.40	✗
Post traumatic seizure	28	2.15	12	5.06	✓

# Conclusion

- GCS is an important factor as the lower it is, the greater the incidence of an abnormal scan and also the more severe the intracranial injury
- Being on 'Anticoagulation' is by far the most common indication for an acute CT Head; but this is not significantly associated with abnormal findings
- Factors significantly associated with abnormal findings are:
  - Haemotympanum
  - Bruising around the eyes / ears
  - Post-traumatic seizure
- Further subgroup analysis is ongoing to devise a way of identifying which patients need imaging more urgently than others

# References

- Stiell, I.G. et al. (2001). The Canadian CT Head Rule for patients with minor head injury. *Lancet*, 357(9266), pp. 1391-1396.
- NICE (National Institute of Health and Care Excellence). 22 January 2014. Selection of adults for CT head scan. [online]. Available from: [imaging-algorithm-pdf-498950893 \(nice.org.uk\)](https://www.nice.org.uk/guidance/ta498950893) [accessed 24 April 2022].