

# First-degree Atrioventricular Block in Combination with Age $\geq$ 80 years is Predictive of Subsequent Pacing Requirement in Patients with Syncope

*A Retrospective Single Centre Study of Implantable Loop Recorder Data*

Dr Nadeev Wijesuriya – ST4 Cardiology  
Dr Michael Koa Wing – Consultant Cardiologist  
Dr Phil Moore – Consultant Cardiologist  
Dr Will Wallis – Consultant Cardiologist



# Indications for Loop Recorder Implantation

## ➤ SYMPTOMS

- Palpitations
- Syncope/Pre-Syncope

## ➤ REQUIREMENT

- Absence of conventional pacing indication on resting 12 lead ECG +/- ambulatory monitoring



# Pacing indications in suspected Brady-arrhythmia

ECG characteristic	Evidence
Syncope, Bundle Branch Block + positive EP study	IB
Alternating bundle branch block (with or without symptoms)	IC
Bundle Branch Block, syncope, non diagnostic investigations	IIb - C
<b>First degree atrioventricular block</b>	<b>No current recommendations</b>



# Evidence for risk factors identified by loop recorders<sup>1</sup>

- Mitro et al (2017)
  - Retrospective single centre cohort study of 112 patients
- Univariate analysis
  - Age > 65 p = 0.01
  - 1<sup>st</sup> degree AV block p = 0.005
  - Absence of prodromal symptoms p = 0.02
  - Trauma secondary to syncope p = 0.011
  - Sinus bradycardia p = 0.002



# Hypothesis

- Combination of increased age & ECG predictors  
→ direct pacemaker implantation
- Investigation of hypothesis
  - Retrospective observational study of population in West Hertfordshire who received ILR (2015-2018)



# Methods

- Local database used to identify patients
- Data collection: MedCon, discharge summaries, medical notes & ECGs
- Recorded indication, initial resting ECG findings, ILR findings and outcomes



# Results

- 174 ILR implants at WGH for syncope
- 127 patients were aged 79 and younger (73%).
  - **6% (n=8) required subsequent pacing.**
- 47 patients aged 80 or over (27%).
  - **34% (n=16) required subsequent pacing**
  - **(p = 0.000002)\***

\*Fisher exact test



# Results

- *Age  $\geq 80$  in isolation* does not predict subsequent pacemaker implantation
- 4% (n=5) < 80 with normal resting ECG required pacing
- 14% (n=3)  $\geq 80$  with normal resting ECG required pacing
  - $p = 0.13$

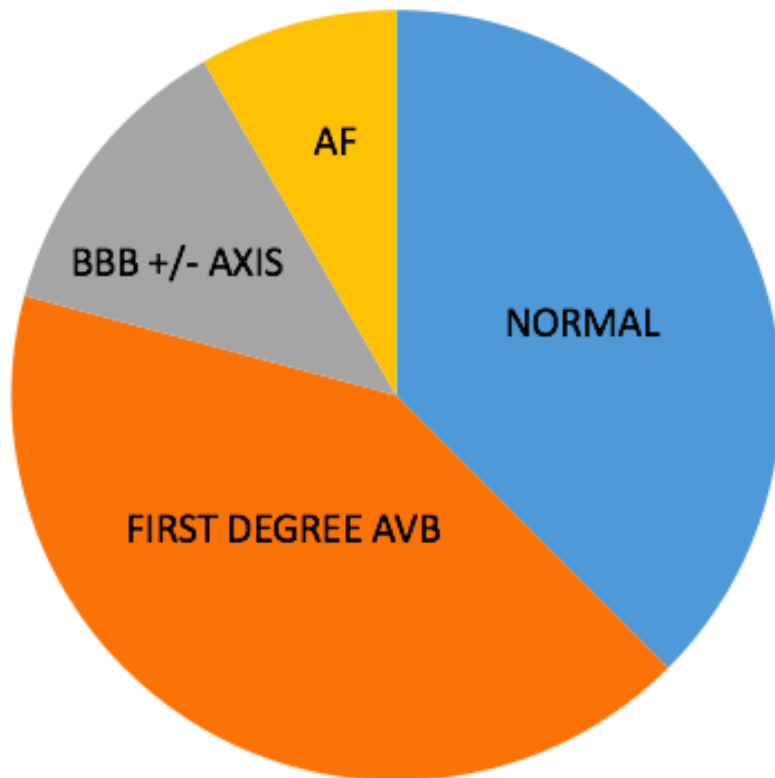




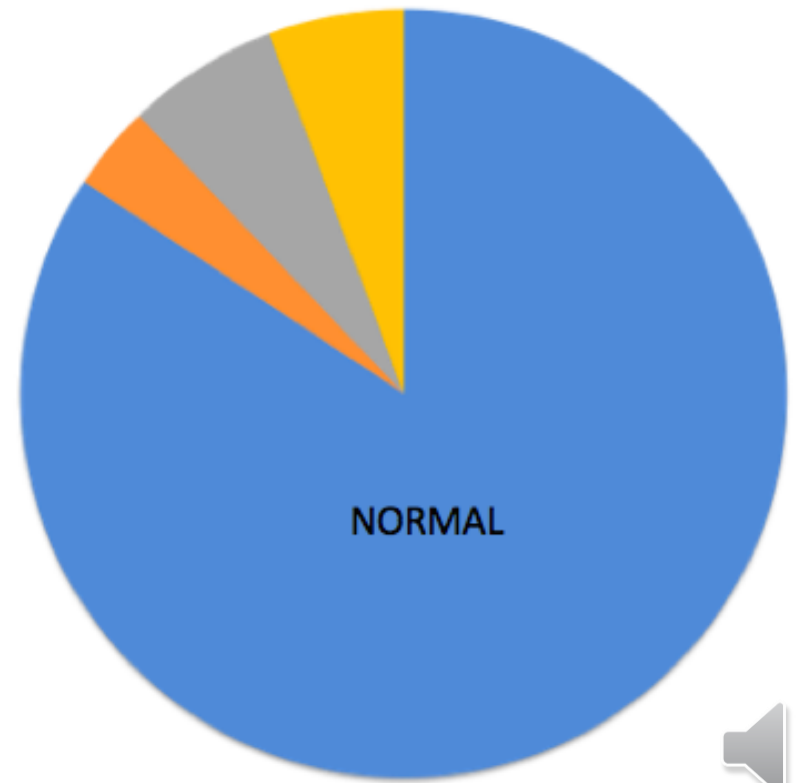
# Results

12 lead ECG abnormalities at the time of  
loop recorder implantation

REQUIRED PACING



DID NOT REQUIRE PACING



# Results

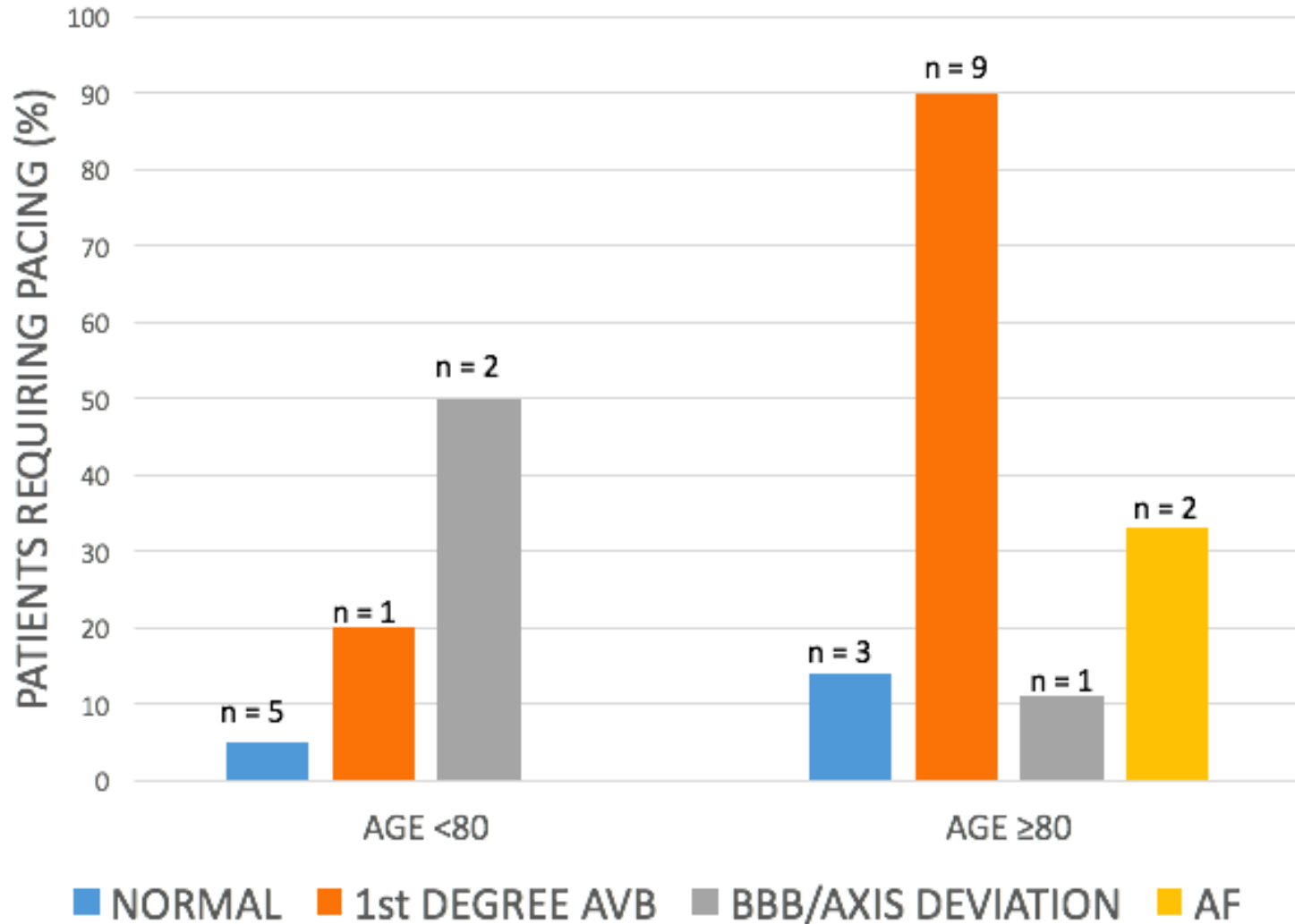
- First degree AV block is a significant risk factor for subsequent pacing requirement ( $p < 0.0001^*$ )
  - 6% (n=8) with normal ECG's required subsequent pacing
  - 66% (n=10) with first degree AV block required subsequent pacing

\*Fisher Exact Test



# Results

Pacing requirement Aged <80 years *cf* aged ≥80 years



# Results

- **90% (n=9) aged  $\geq 80$  in combination with first degree AV block (PR  $>200$ ms) required subsequent pacemaker implantation ( $p < 0.0001$ )\***
  - Mean time from ILR to pacemaker implantation 298 days +/- 129
- First degree AV block did not predict subsequent pacing in those aged  $<80$  ( $p = 0.24$ )\*

\* Fisher Exact Test



# Results

Age  $\geq$  80 in combination with first degree AV block did not predict pacing *indication* at time of implant.

- 5 patients received ILR diagnosis of high grade AV block
- 4 patients received ILR diagnosis of symptomatic sinus node dysfunction



# Results

- PR duration in isolation does not predict subsequent pacing requirement ( $p = 0.66$ )\*

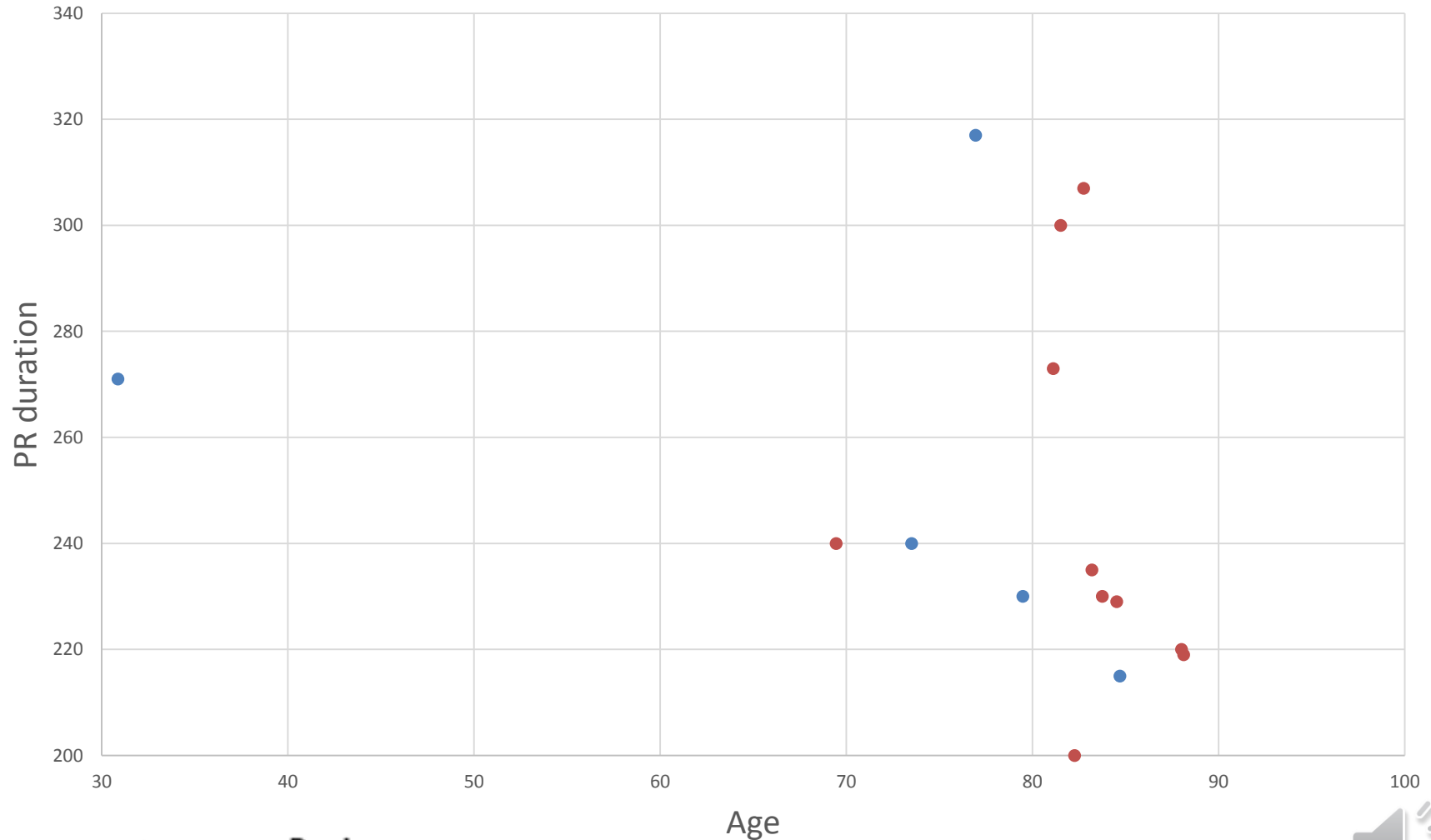
All Patients with First Degree AVB	PR interval (mean +/- SE)
Required pacing (all ages)	245ms +/- 11
Did not require pacing (all ages)	254ms +/- 18

\* Unpaired t-test



# Results

There is no correlation between age and PR duration ( $R = -0.25^*$ )



● No pacing required

● Pacing required

\*Correlation co-efficient



# Conclusions

- The PR interval duration in isolation does not predict subsequent pacing requirement
- Age  $\geq$  80 years isolation does not predict subsequent pacing requirement
- **The combination of age  $\geq$  80 and 1<sup>st</sup> degree AVB on initial resting 12 lead ECG is strong predictor of subsequent pacing requirement**





# Limitations

- Retrospective study
- Small sample size



# Recommendations

- Multi-Centre observational study
- Future directions: Develop scoring system for pacing in suspected bradycardia
  - Including risk factors:
    - Age
    - Trauma due to syncope
    - Lack of prodromal symptoms
    - ECG characteristics



# Questions?

- Correspondence:
  - [nadeev.wijesuriya@nhs.net](mailto:nadeev.wijesuriya@nhs.net)

## References

1. **Clinical characteristics associated with bradycardia and asystole in patients with syncope undergoing long-term electrocardiographic monitoring with implantable loop recorder - [Wien Klin Wochenschr.](#) 2017 Jul;129(13-14):451-457. doi: 10.1007/s00508-017-1197-8. Epub 2017 Apr 27.**

