

# SERUM DIGOXIN CONCENTRATIONS: CLINICAL SIGNALS

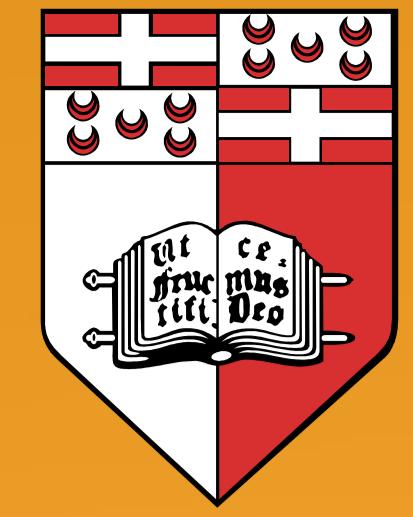
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## INTRODUCTION

- Digoxin, as a treatment option in cardiology, is limited by its narrow therapeutic index.
- Current European Society of Cardiology (ESC) guidelines provide a Class 1 Level of Evidence B recommendation for digoxin in atrial fibrillation, and classify it as a treatment of uncertain benefit in heart failure.<sup>1</sup>
- Clinical guidelines recommend targeting a serum digoxin concentration (SDC) between 0.5 and 0.9 ng/ml, or <1.0 ng/ml.<sup>1,2,3</sup>

## AIMS

- To determine the number of patients on digoxin in Malta
- To analyse SDCs recorded at Mater Dei Hospital (MDH)
- To determine adherence to the clinically recommended target SDC
- To assess queries concerning digoxin processed by the Drug Information Unit (DIU) at MDH

## METHOD

### Number of digoxin-treated patients

- Government pharmaceutical dispensing data for November 2016 to February 2017 was analysed and the number of patients receiving digoxin and the mean daily dose were determined.

### Retrospective analysis of SDCs

- Data for SDCs recorded at the MDH Pathology Laboratory from January 2008 to December 2016 was collected.
- Patient variables selected for inclusion in the analyses were: SDC value, gender, age, origin of SDC request, referring physician and number of SDCs requested.

- The SDC values collected were compared to the SDC target range recommended by the ESC guidelines (0.5 to 0.9 ng/ml) and classified as below, within and above the target range.<sup>1</sup>

### Requests for information at the DIU

- All enquiries processed by the DIU between April 2002 and December 2014 were collected and requests concerning digoxin were classified according to the reason for the query.
- The data was analysed using the JASP (Version 0.7.5.6) statistical package. Descriptive statistics and a comparison of means via the Student's t-test were carried out.

## RESULTS

- In March 2017, 2,059 patients were receiving digoxin treatment via the government pharmaceutical system in Malta. Mean daily dose was 0.13 mg (range 0.03 –0.25 mg).
- A total of 17,388 valid SDCs from 5,653 patients (61% female, 39% male, mean age 78±11 years, range 1-111 years) were analysed.
- Mean number of SDCs per patient was 3 (range 1-47). Mean SDC was  $1.30 \pm 0.99$  ng/ml (range <0.1-2.0 ng/ml), with 32% of SDCs within the recommended range (Fig. 1).
- Eight-five percent of SDC requests originated from MDH, with 43% of these from the A&E (mean  $1.17 \pm 1.01$  ng/ml).
- Of the 14,369 queries processed by the DIU, 91 (0.6%) concerned digoxin. The top three enquiries were related to administration (26%), interactions (15%) and dosing (15%).

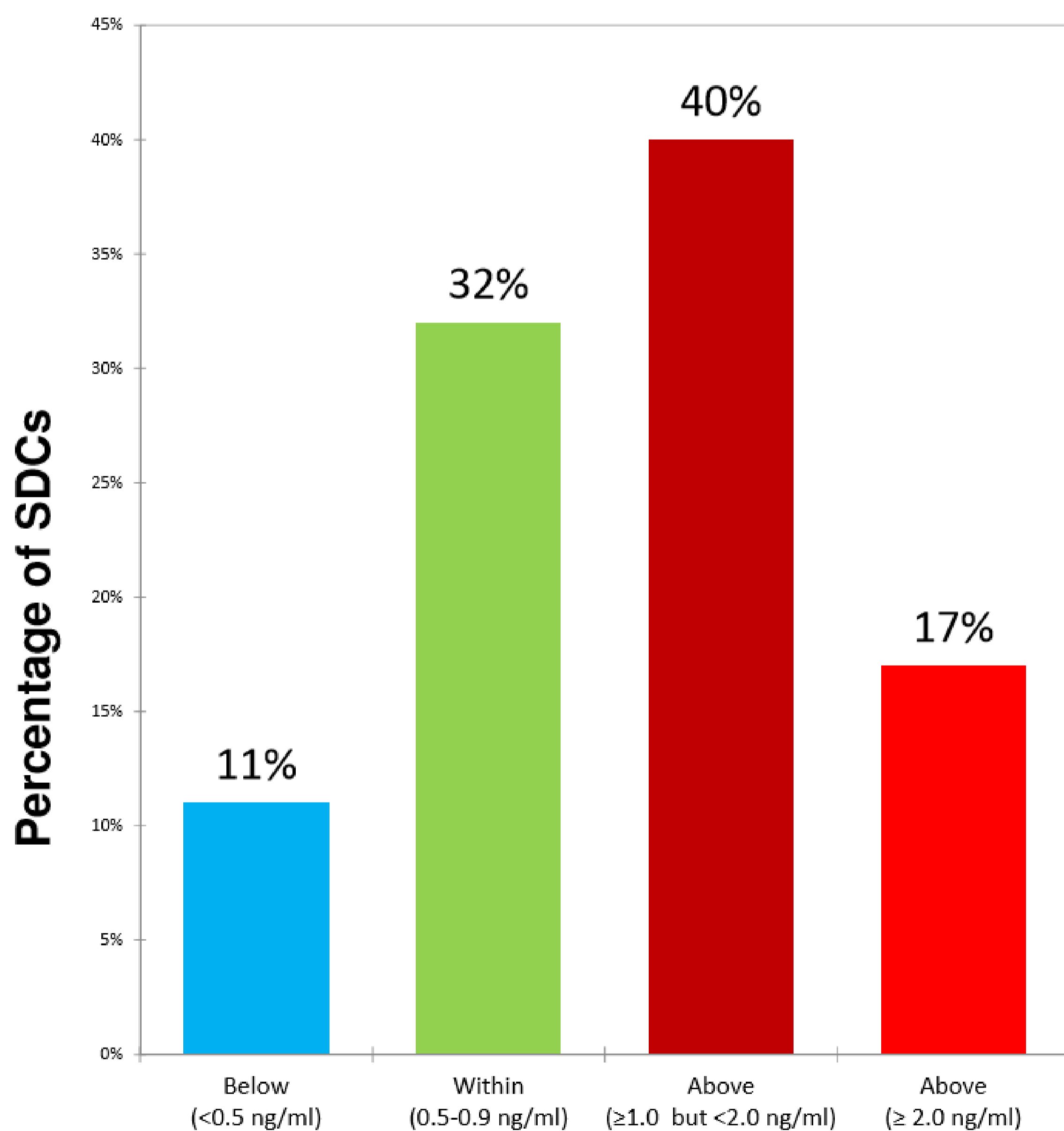


Figure1 - Variation from target SDC (0.5-0.9 ng/ml)  
N=17,388, MDH 2008-2016

## CONCLUSION

The mean SDC of 1.30 ng/ml is above the upper limit for the clinically recommended target. The number of queries regarding digoxin is low (0.6%) compared to the number of out-of-range SDCs (68%), indicating the need for the DIU to disseminate its services. Further research is warranted to investigate the clinical implications of these signals.

### References

<sup>1</sup>Kirchhof P, Benussi S, Koteka D, Ahlsson A, Atar D, Casadei B, et al. 2016 ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS. *Europace*. 2016; 18 (11):1609-78.

<sup>2</sup>Lindenfeld J, Albert NM, Boehmer JP, Collins SP, Ezekowitz JA, Givertz MM, et al. Executive Summary: Heart Failure Society of America 2010 Comprehensive Heart Failure Practice Guideline. *J Card Fail*. 2010;16(6):475-539.

<sup>3</sup>Yancy CW, Jessup M, Bozkurt B, Butler J, Casey DE, Drazner MH, et al. 2013 American College of Cardiology Foundation/American Heart Association guideline for the management of heart failure: Executive summary. *Circulation*. 2013;128 (16):1810-52.