

# ACCURACY AND RELIABILITY OF GLUCOSE METERS USED AT DIABETES CLINIC OF OAUTHC ILE-IFE

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## INTRODUCTION

- Self-Monitoring of blood glucose (SMBG), an important tool in diabetes management help patients achieve and maintain target glycaemic levels hence reducing complications.
- It is usually done with glucose meters which are affordable, portable and easy to use.
- Significant variations sometimes observed in glucose meter readings necessitated this study.
- We evaluated the accuracy of glucose meters used routinely in our unit using ISO 15197 guideline.

## MATERIALS AND METHODS

- The study was conducted at medical outpatients department (Diabetes clinic) of Obafemi Awolowo University Teaching Hospital Complex.
- It was conducted on a clinic day
- The random glucose meter reading of 49 diabetics on routine clinic visit were compared to a simultaneously conducted standard laboratory measurement using glucose oxidase method.
- Three glucose meters were evaluated: On-callPlus®(ACCON Biotech), Accu-Chek® (Roche) and EasyMax® (EPS BioTechnology Corp)
- Data obtained were analysed using statistical package for Social sciences

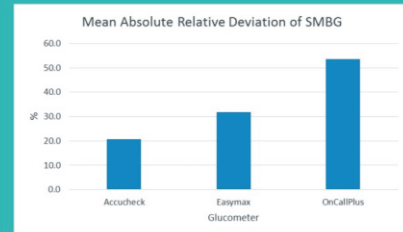
## RESULTS

- The glucose meters, Accu-chek, Easymax and On-callPlus had 45.5, 27.3 and 18.2% of its samples read as <75mg/dl within the target range of  $\pm 1.5$ mg/dl of the reference instrument.
- None met the ISO 15197 target of 95%.
- For all samples reference instrument read as  $\geq 75$ mg/dl, 57.9, 28.9 and 7.9% of Accu-chek, Easymax and On-callPlus reading respectively were within  $\pm 20\%$  accuracy.
- Accu-chek also had the highest accuracy of 27.3% for samples read as <75mg/dl within the target range of  $\pm 10$ mg/dl and  $\pm 5$ mg/dl to the reference instrument.
- Pearson correlation analysis of glucose meters and laboratory readings were Accu-Chek(.980), Easymax(.983) and On-callPlus(.971) respectively.
- Accu-chek had the least mean absolute standard deviation and thus was the most

Test Glucometer	Reference samples $\geq 75$ mg/dL N=38		Reference samples <75 mg/dL N=11	
	Corresponding frequency in test glucometer $\pm 20\%$ accuracy	%	Corresponding frequency in test glucometer $\pm 15$ mg/dL accuracy	%
Accucheck	22	57.9	5	45.5
Easymax	11	28.9	3	27.3
Oncallplus	3	7.9	2	18.2

Glucometer type	$\pm 10$ mg/dL		$\pm 5$ mg/dL		Corresponding frequency in Laboratory
	Corresponding frequency in test glucometer	%	Corresponding frequency in test glucometer	%	
Accucheck	3	27.3	3	27.3	11
Easymax	0	0	0	0	11
Oncallplus	2	18.2	2	18.2	11

		VALUES FOR ACCUCHEK GLUCOMETER	VALUES FOR EASYMAX GLUCOMETER	VALUES FOR ONCALL PLUS GLUCOMETER
VALUES FOR EASYMAX GLUCOMETER	Pearson Correlation	.987**		
	Sig. (2-tailed)	0		
	N	49		
VALUES FOR ONCALL PLUS GLUCOMETER	Pearson Correlation	.975**	.987**	
	Sig. (2-tailed)	0	0	
	N	49	49	
VALUES FOR LABORATORY GLUCOMETER	Pearson Correlation	.980**	.983**	.971**
	Sig. (2-tailed)	0	0	0
	N	49	49	49



## CONCLUSION

- The three glucose meters varied in their accuracy and consistency when compared to standard laboratory procedure. This should be borne in mind when interpreting test results and selecting self-monitoring tools.