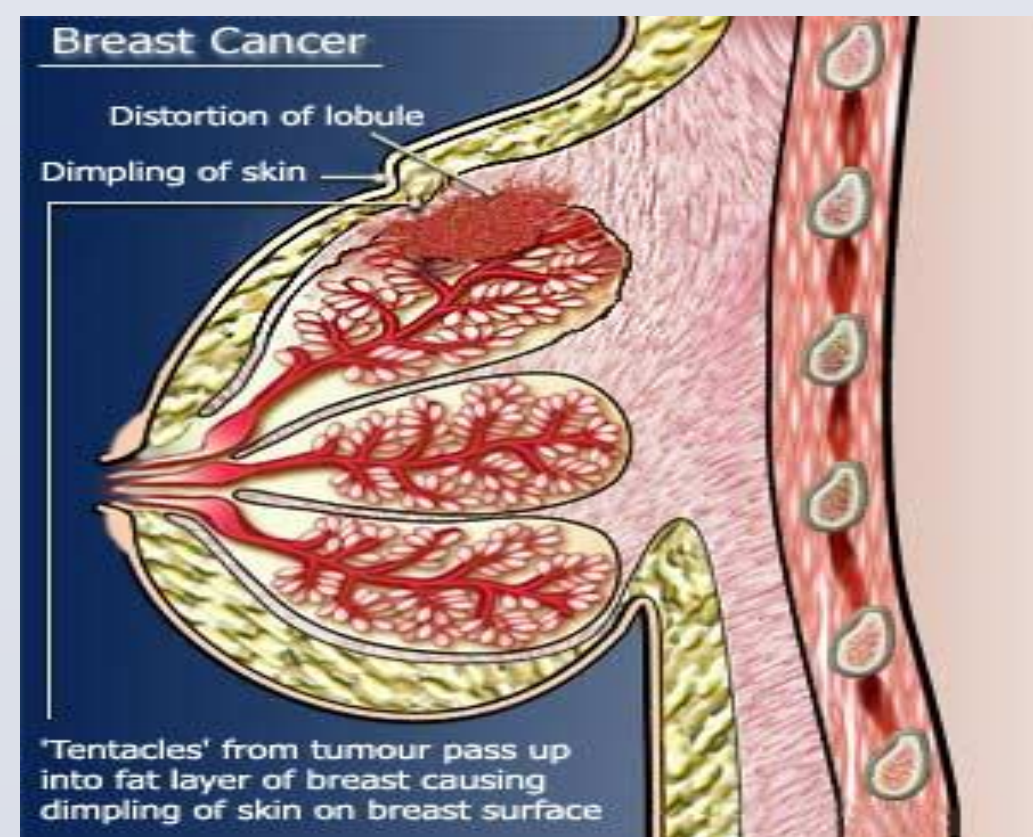


# COMPARISON BETWEEN MANUAL & AUTOMATIC TECHNIQUES OF MEASURING %LVEF ON MUGA SCAN IN BREAST CANCER PATIENTS

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## OBJECTIVES

Chemotherapy is considered very effective in treating breast cancer. But chemotherapy drugs have certain side effects mainly direct negative impact on myocardium. So patient's cardiac functions have to be assessed before and during chemotherapy. MUGA is non invasive nuclear medicine scan of heart using Technetium 99m as radiotracer. MUGA is considered gold standard for measuring %LVEF. There are two techniques of measuring %LVEF on MUGA scan; i.e. automatic and manual. Automatic technique is time saving and operator independent while manual technique is time consuming and operator dependent. The purpose of this study was to compare results of %LVEF by both methods.



Chemotherapy Drug Class	Included Drugs	Associated Side Effects
Anthracyclines	Doxorubicin, Epirubicin	Cardiotoxicity, Myelogenous Leukemia
Taxanes	Paclitaxel, Docetaxel	Peripheral Neuropathy, Hypersensitivity Reactions, Alopecia
Cyclophosphamide	Capecitabine, Fluorouracil	Immunosuppressant, Cardiotoxicity, Gastrointestinal side effects, Deafness, Vascular abnormalities, Neoplasms, Infections, Hepatic effects, Alopecia

## MATERIAL and METHOD

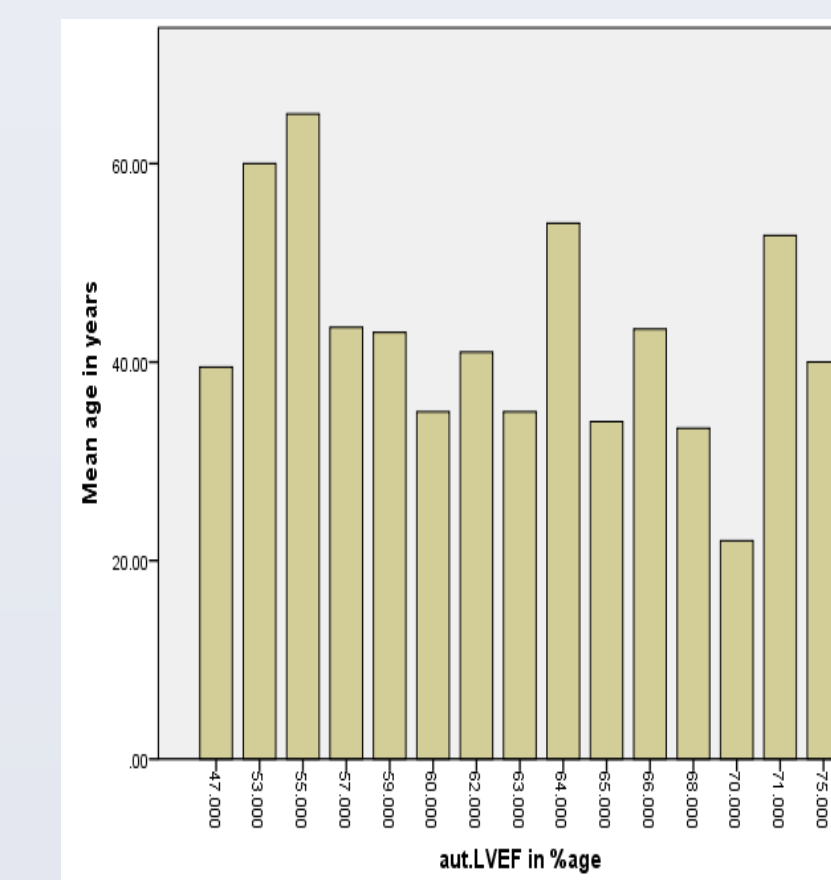
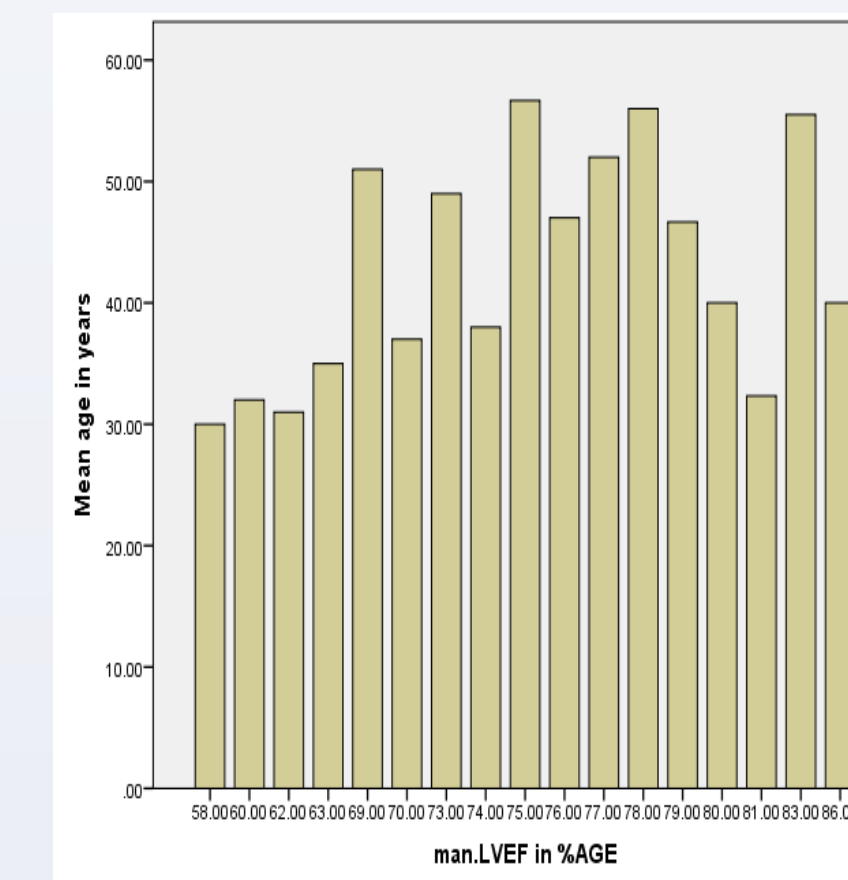
It was an observational study, conducted at Nuclear Medicine department of INMOL. Study population included breast cancer patients undergoing chemotherapy, referred for MUGA scan in INMOL. Scan were performed on Siemens E-cam dual head gamma camera and post processing was done on Siemens eSoft software. Duration of study was 3 months. The data was collected using conservative technique through questionnaire which included patient's demographics, clinical history and consent for using their data for research purpose. Sample size was 30. All the data was analyzed using SPSS version 20.

## RESULTS

In automatic method, computer system makes ROI in both phases; systole and diastole. And then software calculates %LVEF. In manual method, operator draws ROIs for %LVEF calculations. For the same data of a single patient, %LVEF is measured by both methods.

Paired sample t-test was applied to compare %LVEF results of these two methods. Results showed p-value  $0.00 < 0.05$  which indicates that there is significant difference between automatic and manual measurements of MUGA scan.

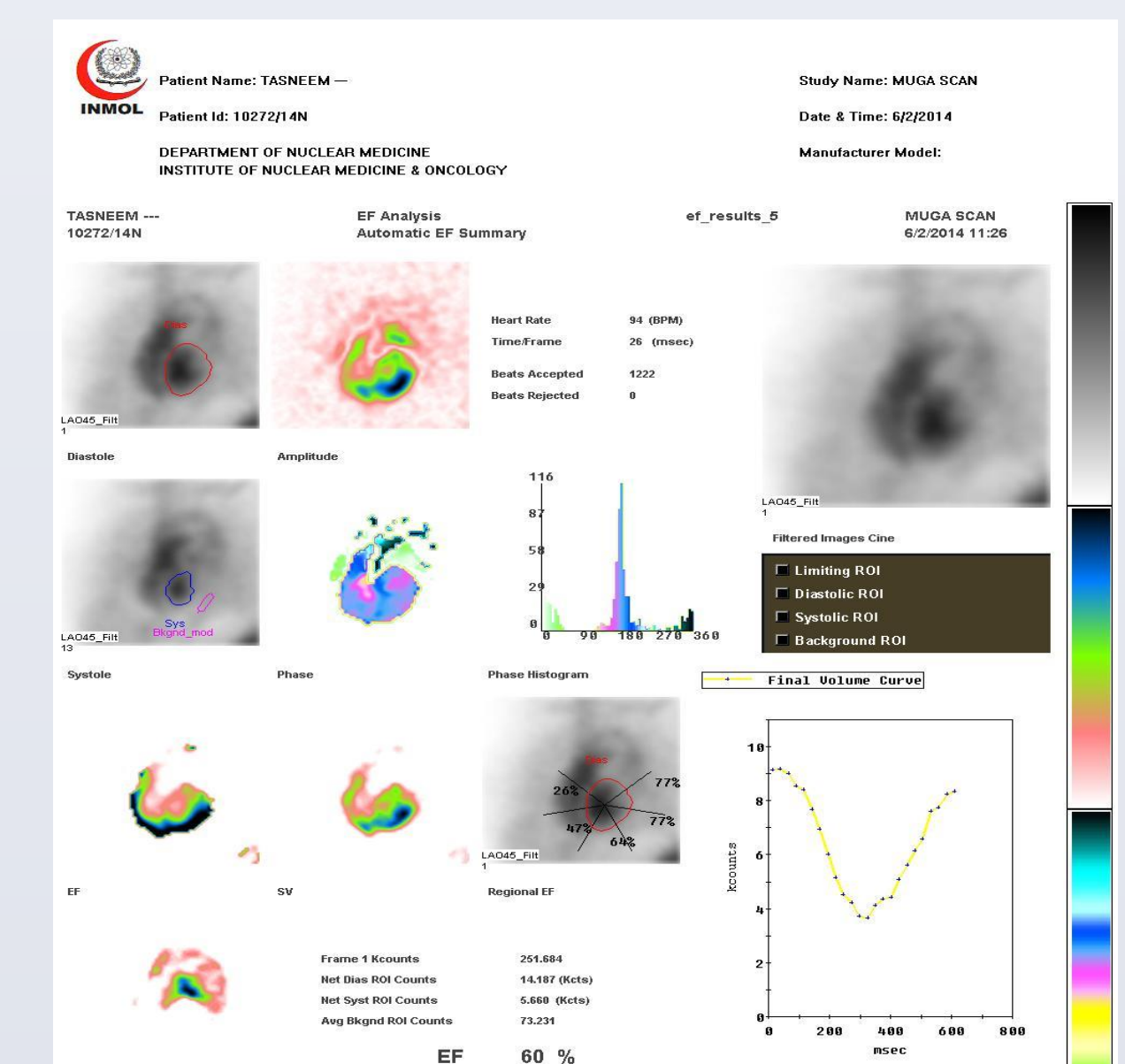
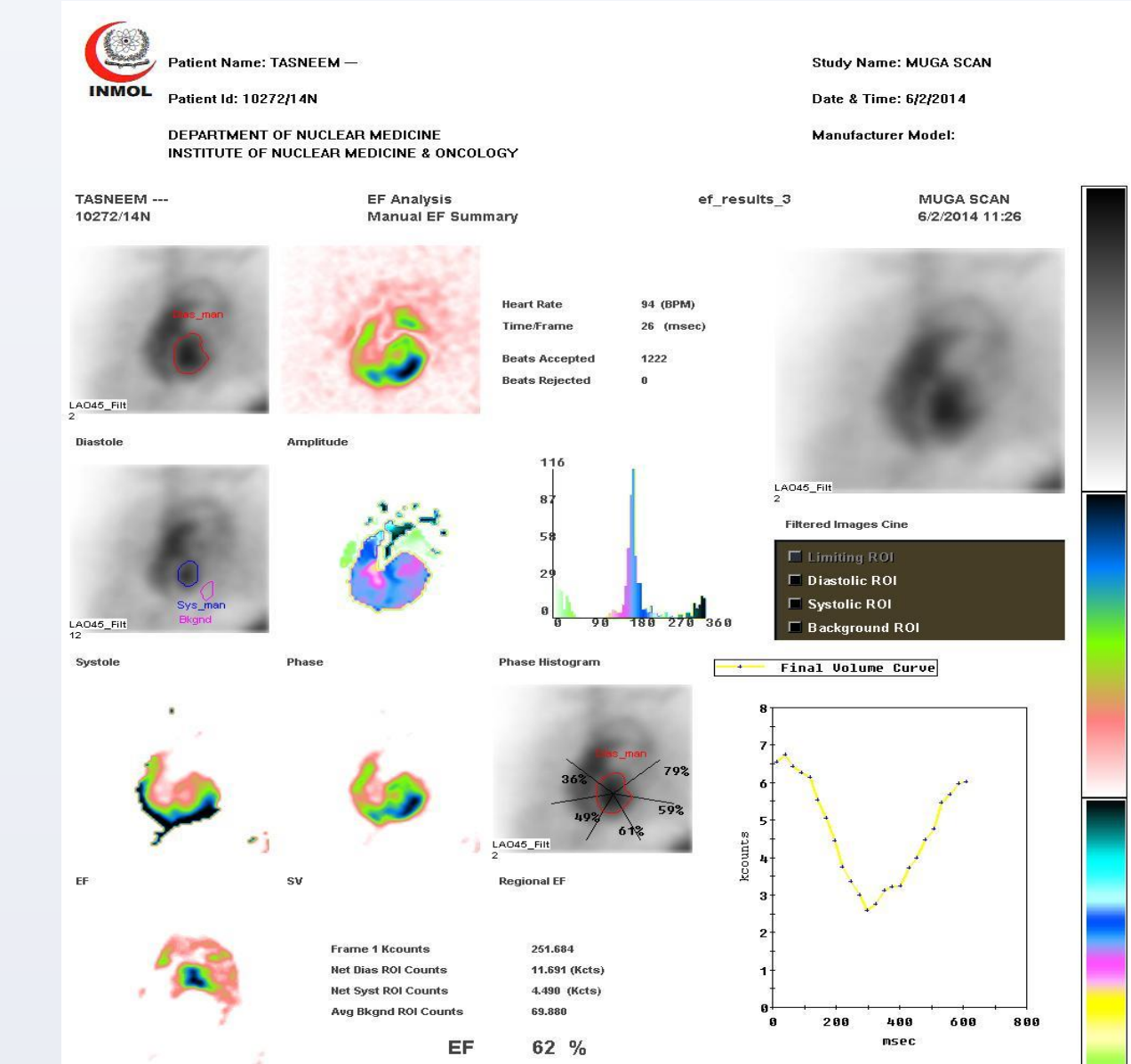
Mean	Std. deviation	t-value	Sig. (2-tailed)
-10.70	5.93	-9.881	.000



## Comparison of %Left Ventricular Ejection Fraction on Manual and Automatic Method

## CONCLUSION

Study showed that there is considerable difference in automatic and manual %LVEF results. It suggests that the data processing is critical part of the whole process of imaging and reporting the scan. Results showed there is significant change in measured %LVEF by both methods which could bring change in further patient management such as it may lead to change in chemotherapy dose and treatment plans. There is need to study data processing more precisely and devise any reference technique to verify the results.



## Comparison of %LVEF on manual and automatic methods

	Minimum value	Maximum value	Mean	Std. Deviation
Automatic LVEF	47	75	63.1	6.8
Manual LVEF	58	86	73.8	7.32

## Comparison of %Left Ventricular Ejection Fraction on Manual and Automatic Method

## ACKNOWLEDGEMENT

I dedicate this thesis work to my parents and then to my mentor Dr. Muhammad Numair Younis who believed in me so that I could be here.