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Appendices

Appendices (A):
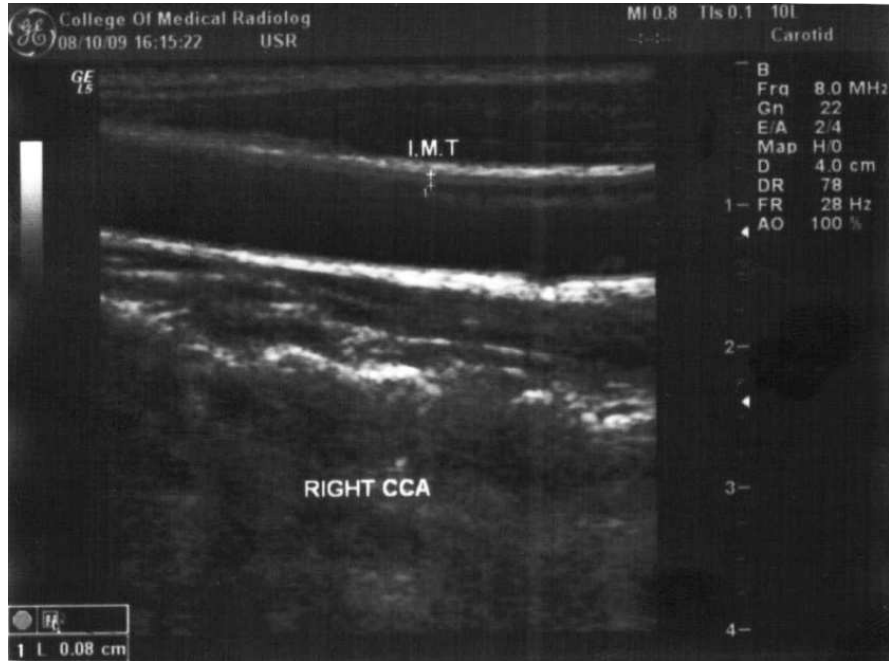
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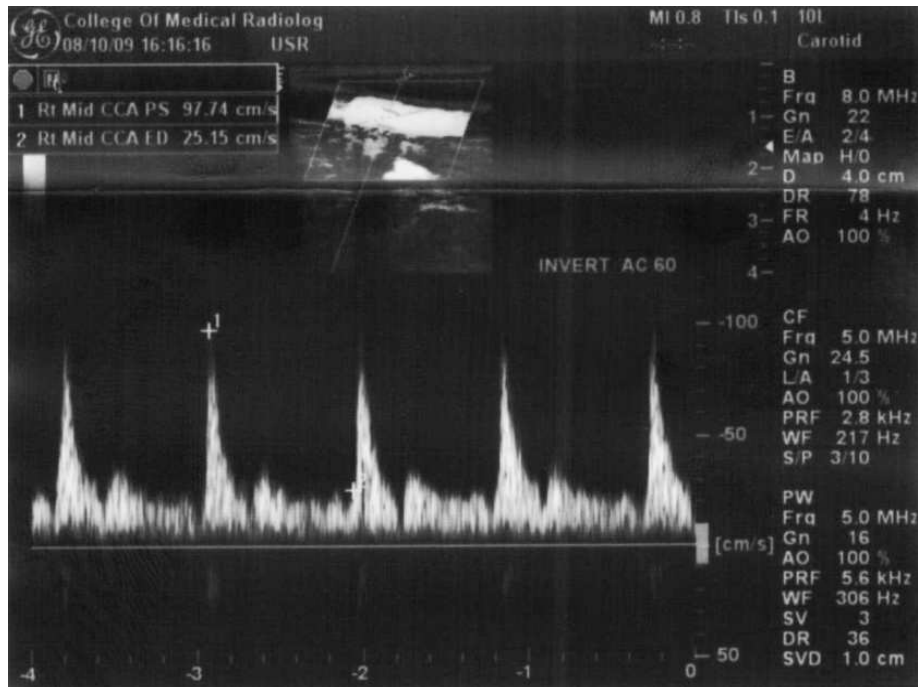
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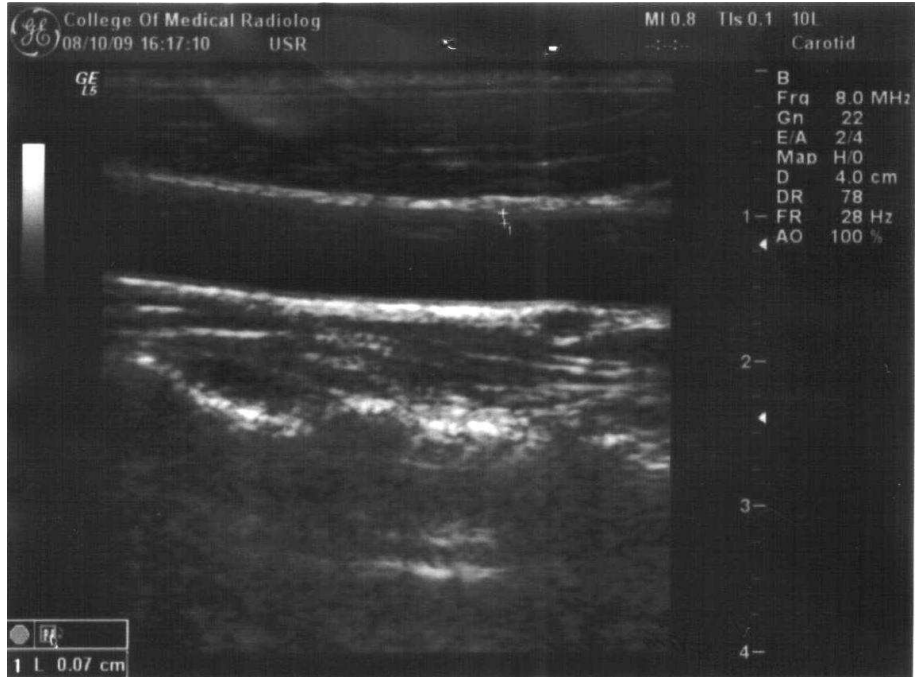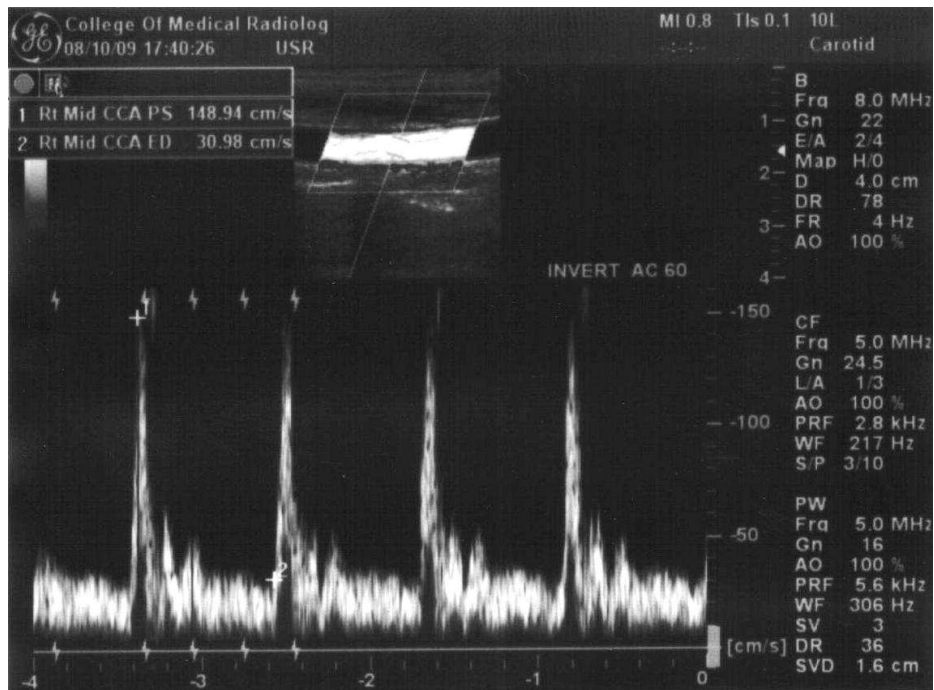
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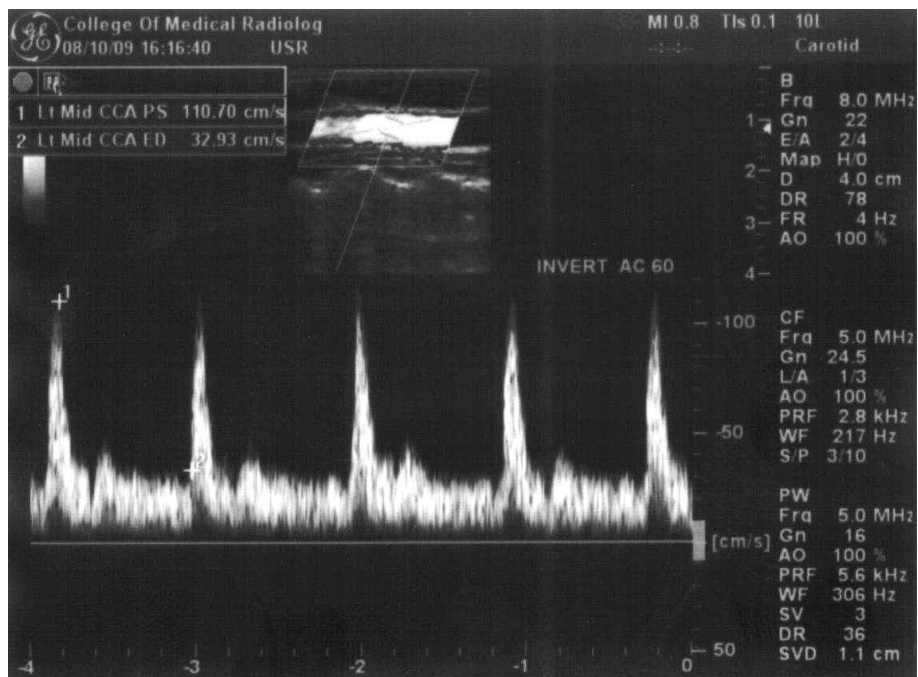
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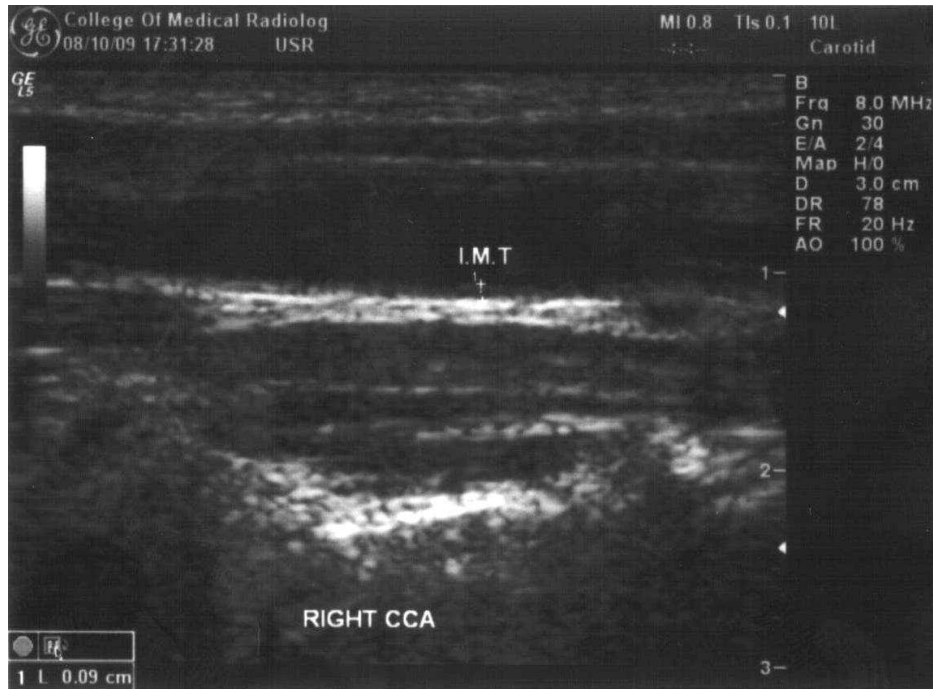
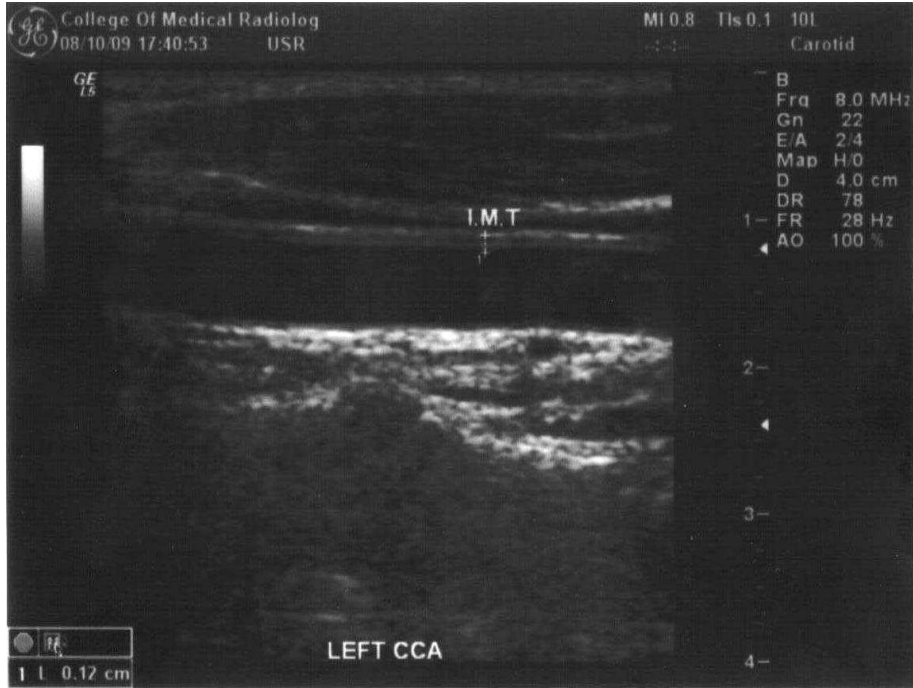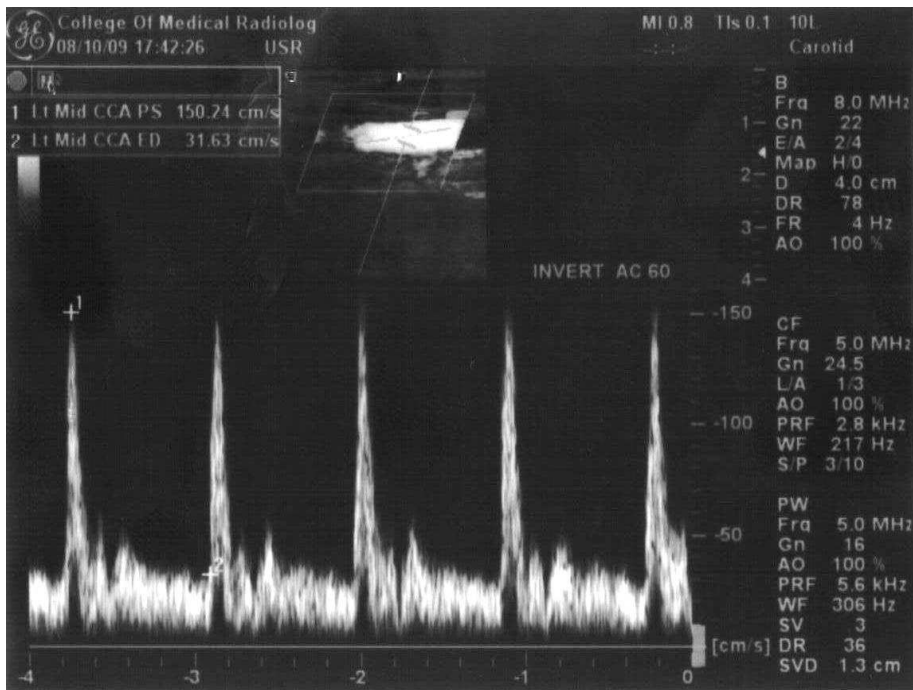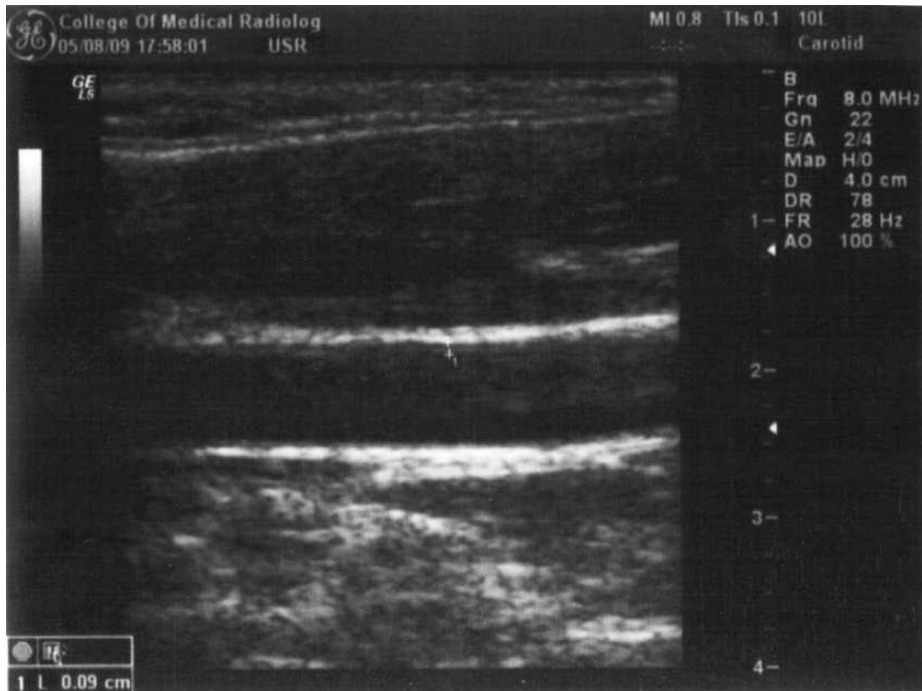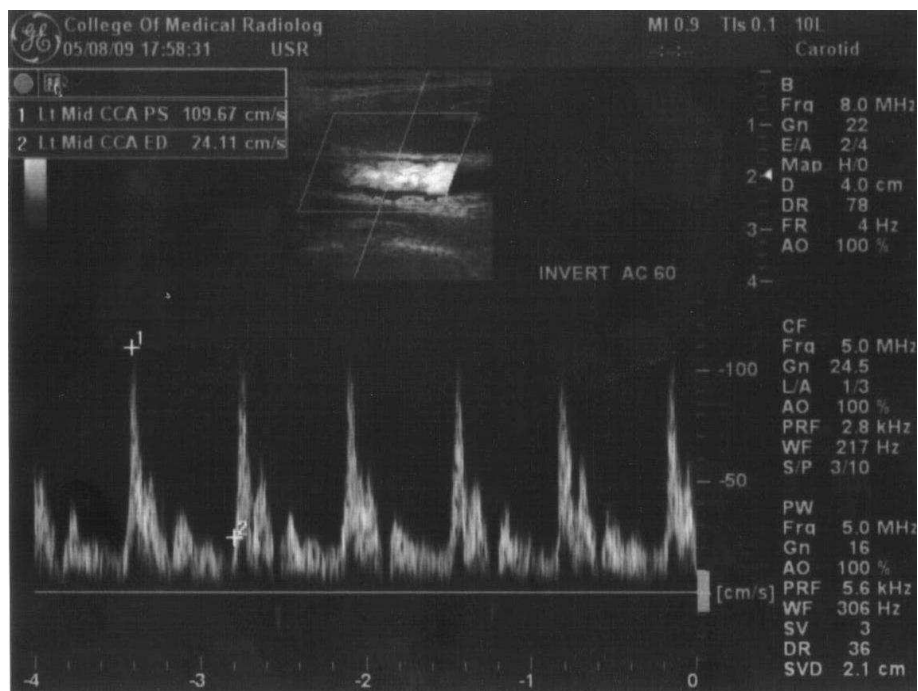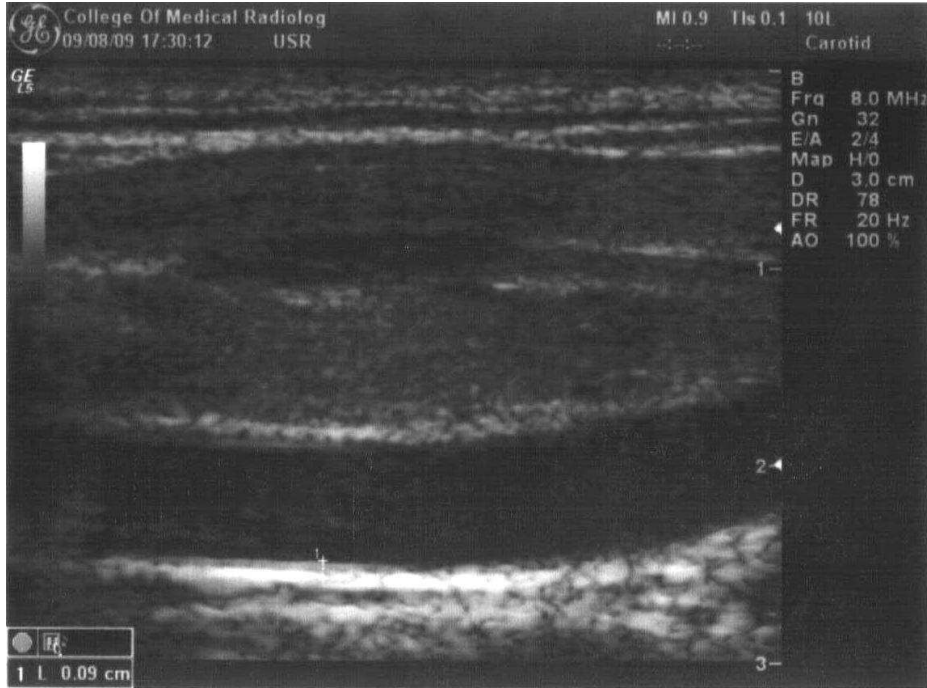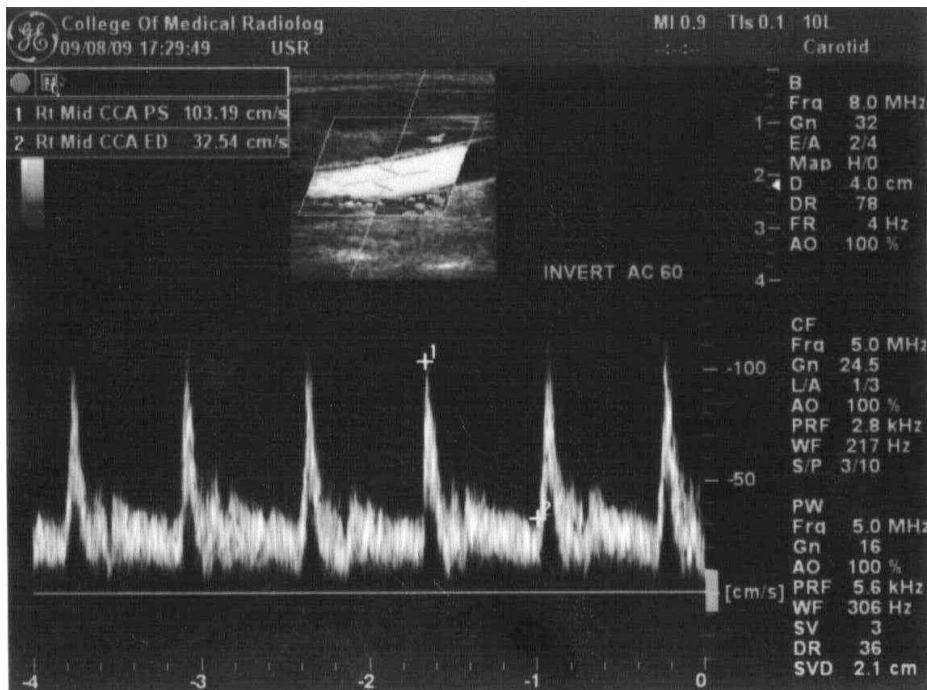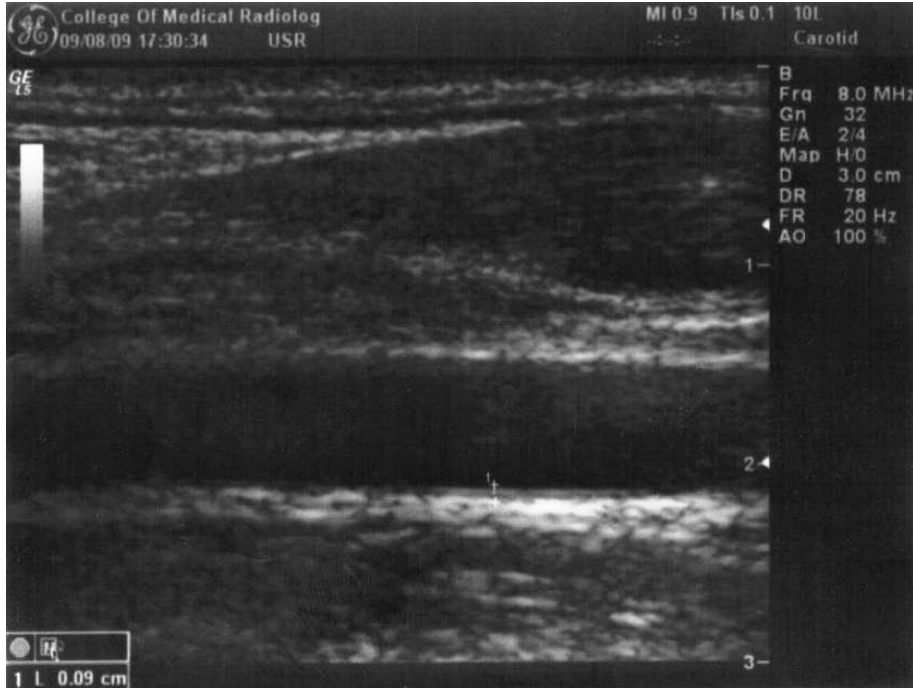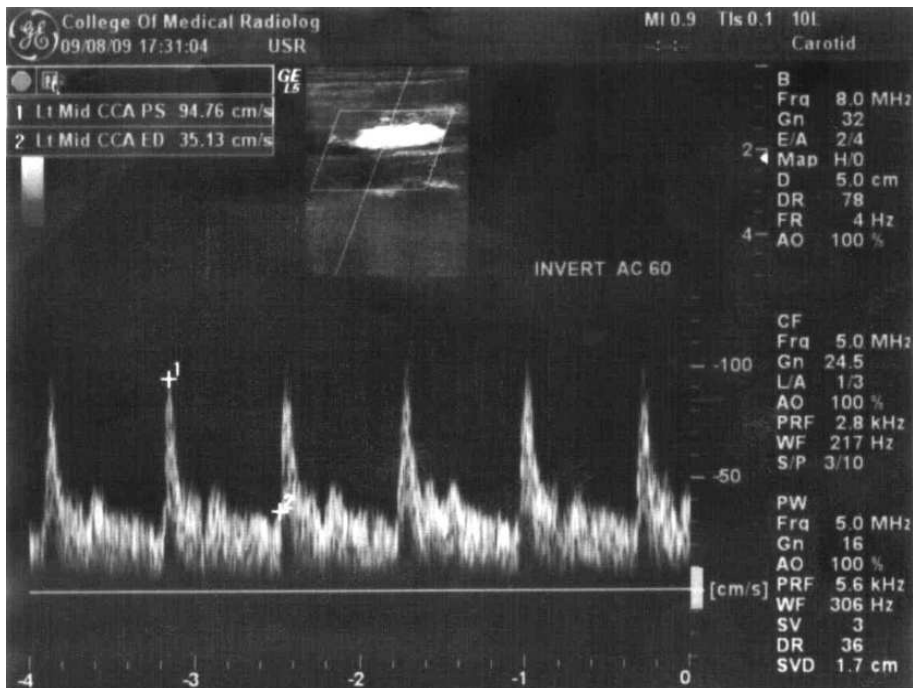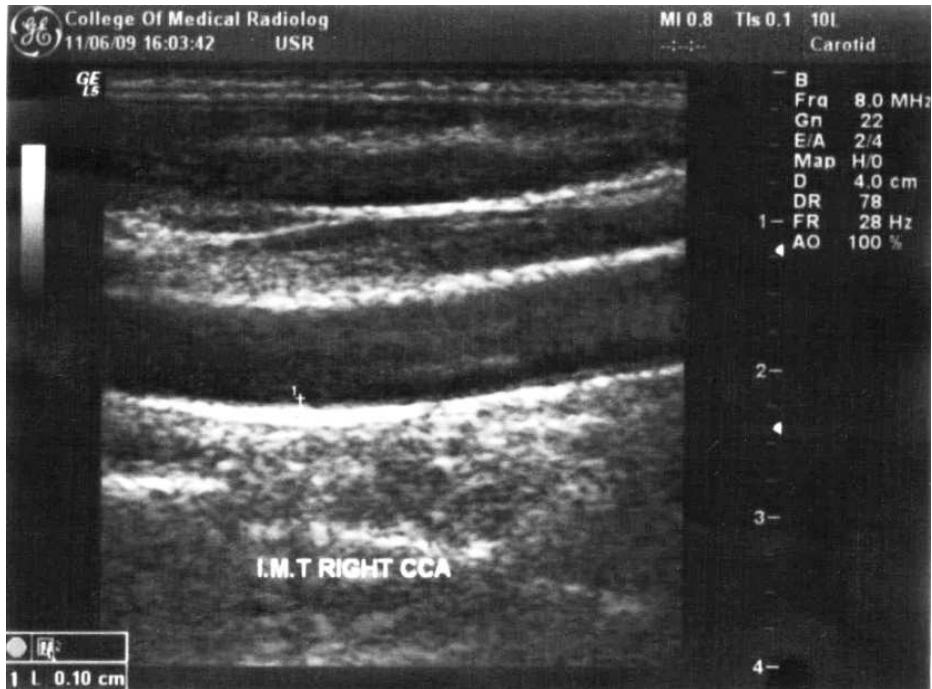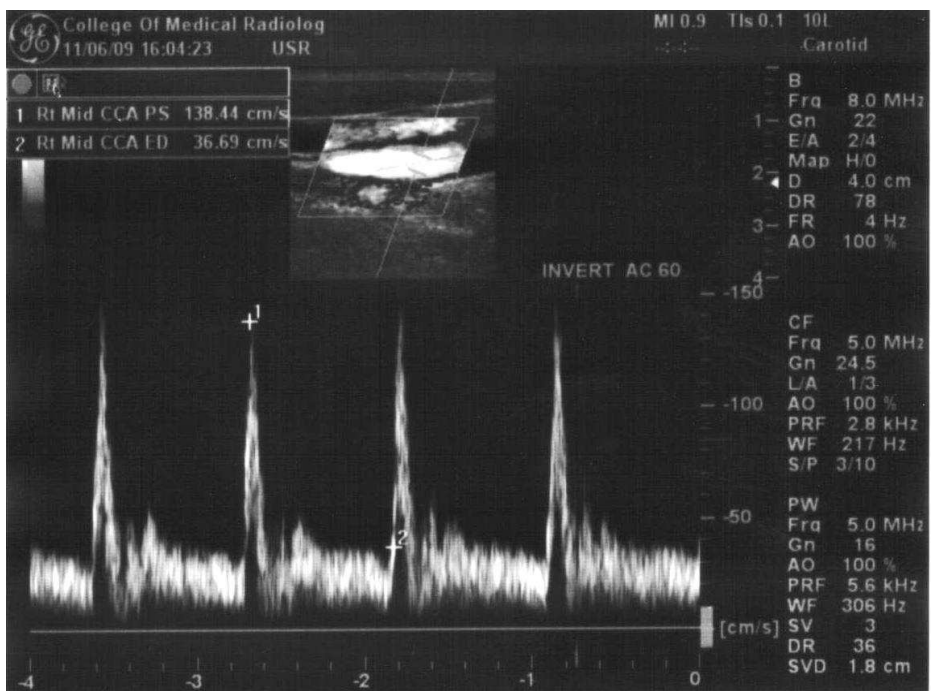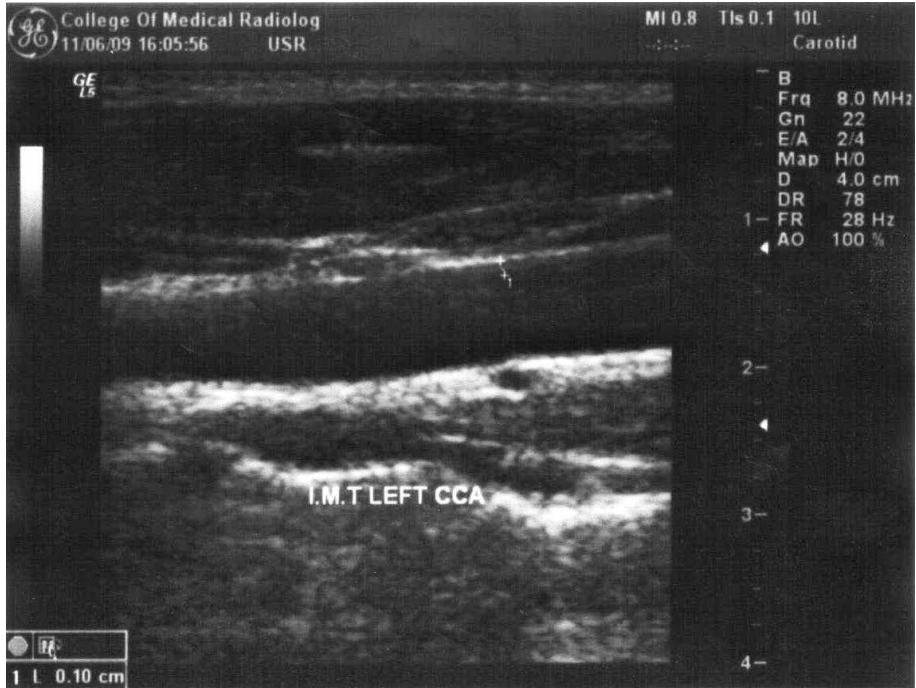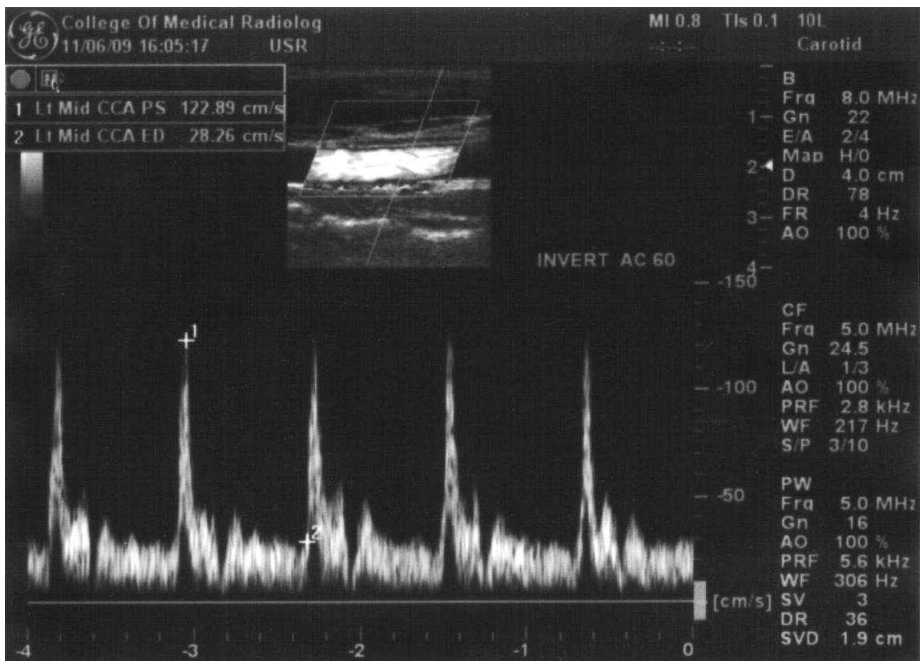**A.2 Rt CCA-Male-21 years-Current smoker (2 CPD) with IIMT-B-mode.**
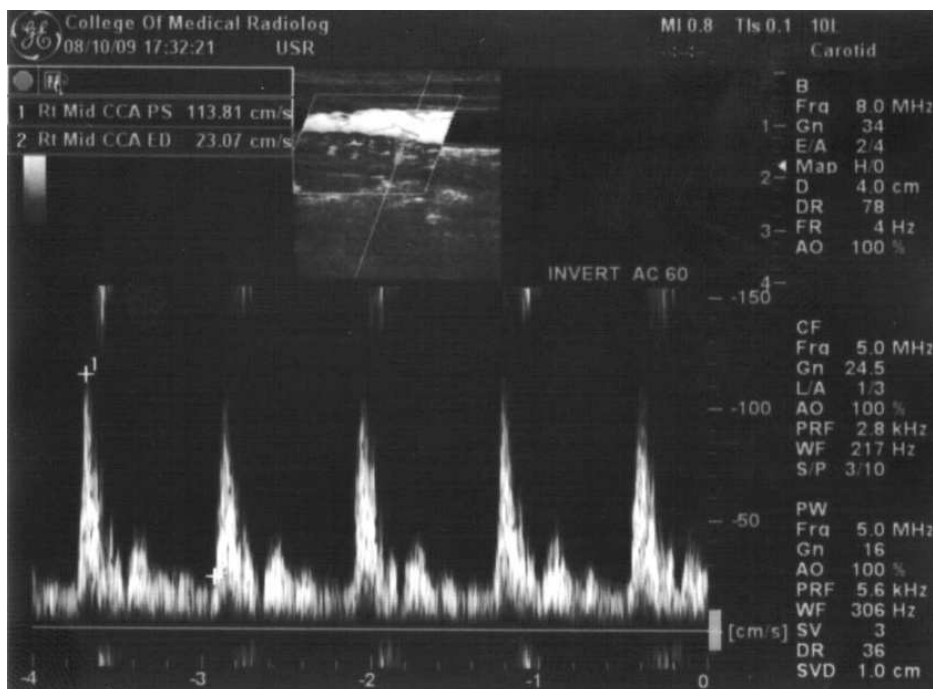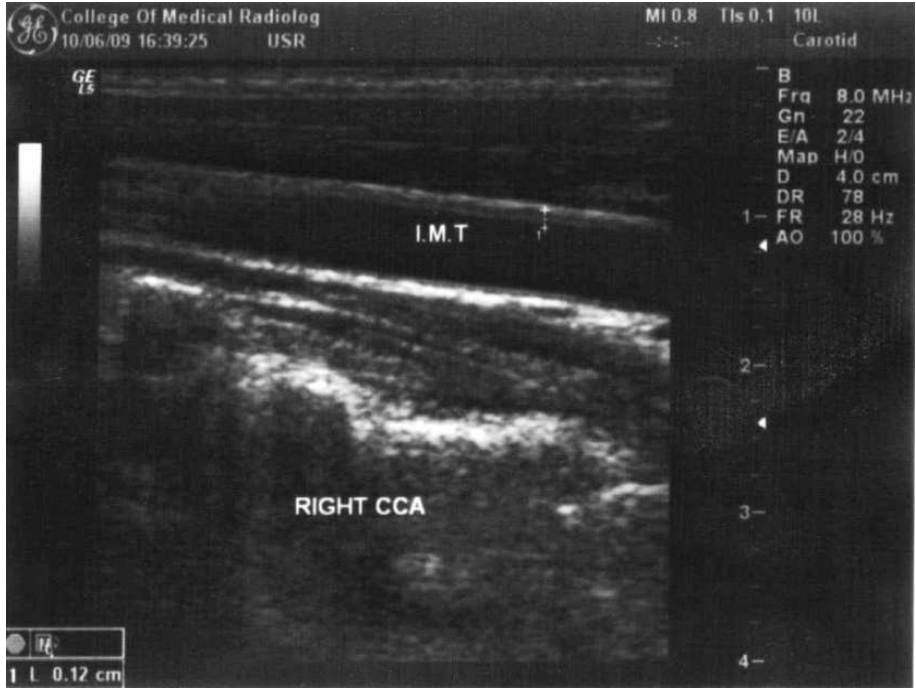

A.2 Rt CCA-Male-21 years- Current smoker (2 CPD) with IPSV and DEDV-Doppler Spectrum.
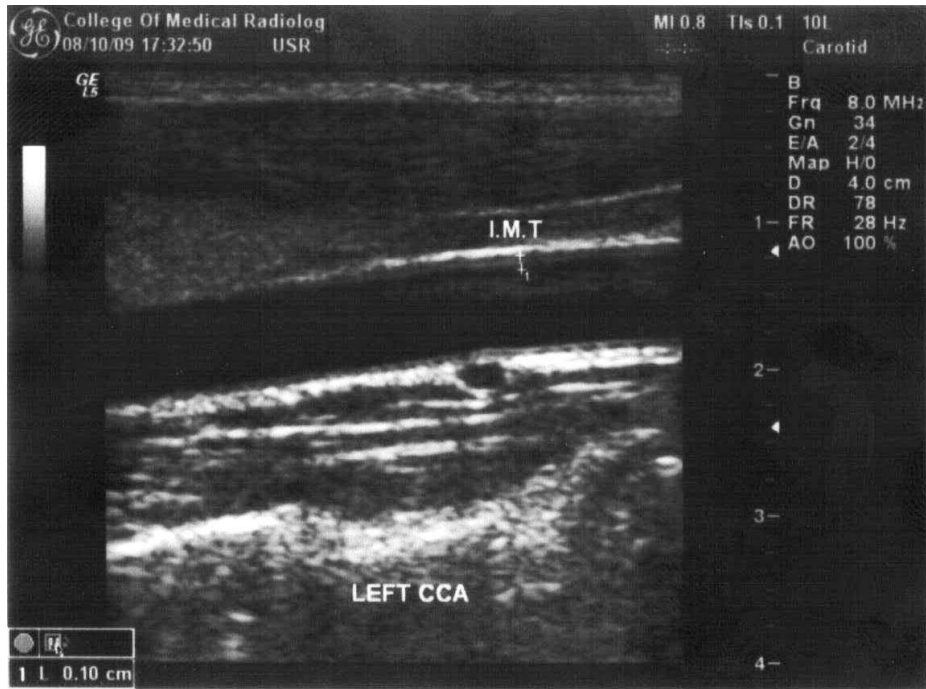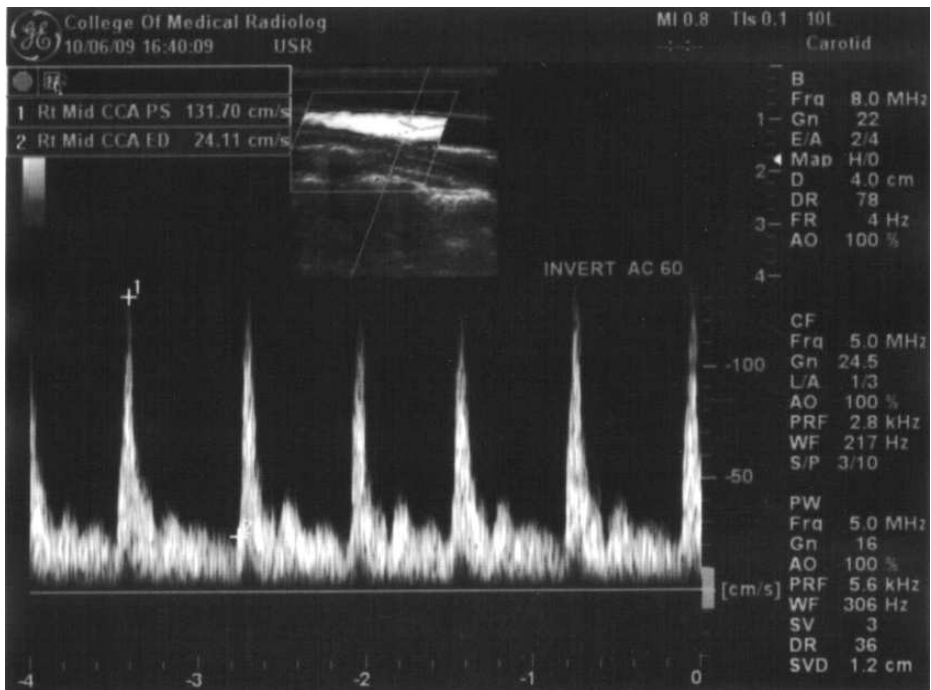
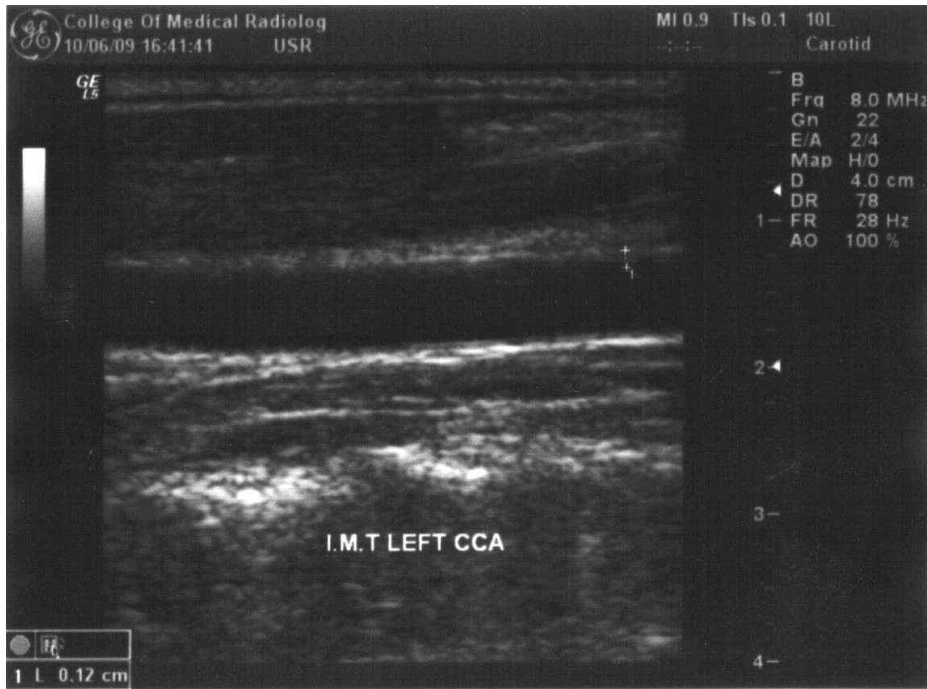**A.2 Lt CCA -Male-21 years-Current smoker (2 CPD) with IIMT-B-mode.**
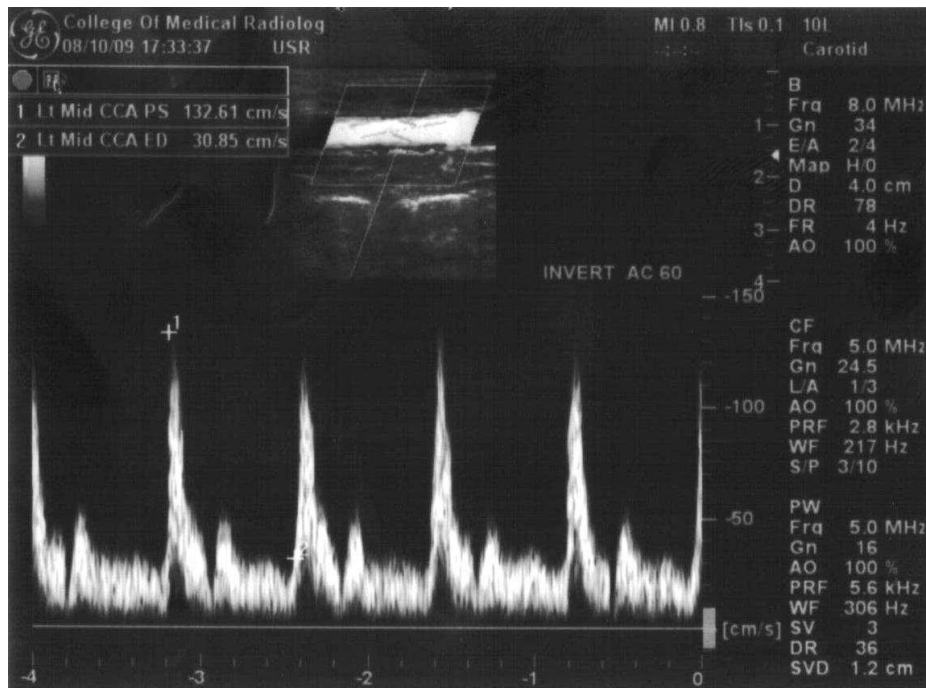
A.2 Lt CCA-Male-21 years- Current smoker (2 CPD) with IPSV and DEDV-Doppler Spectrum.
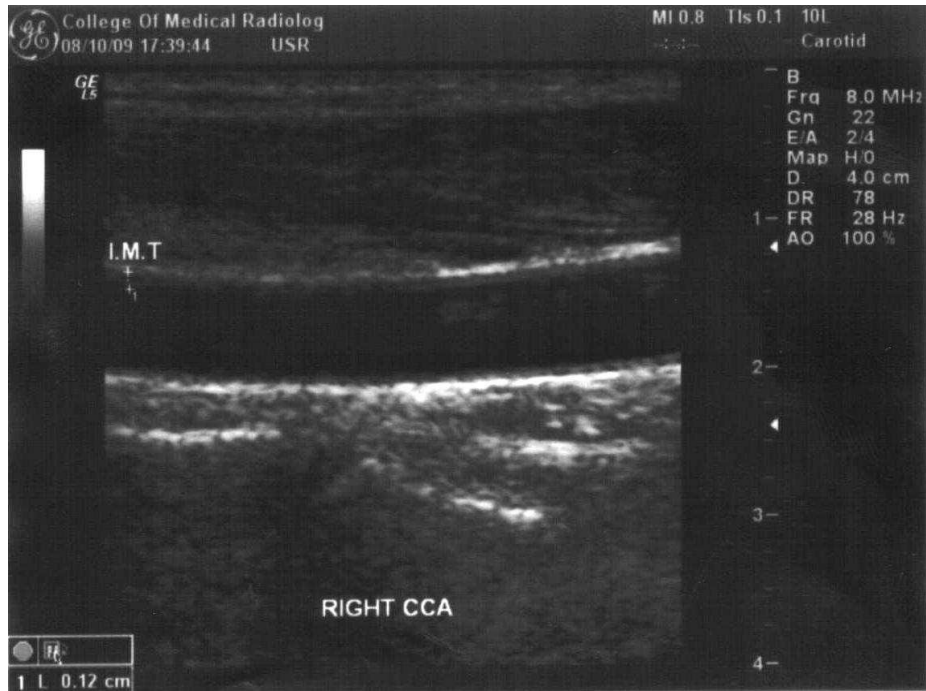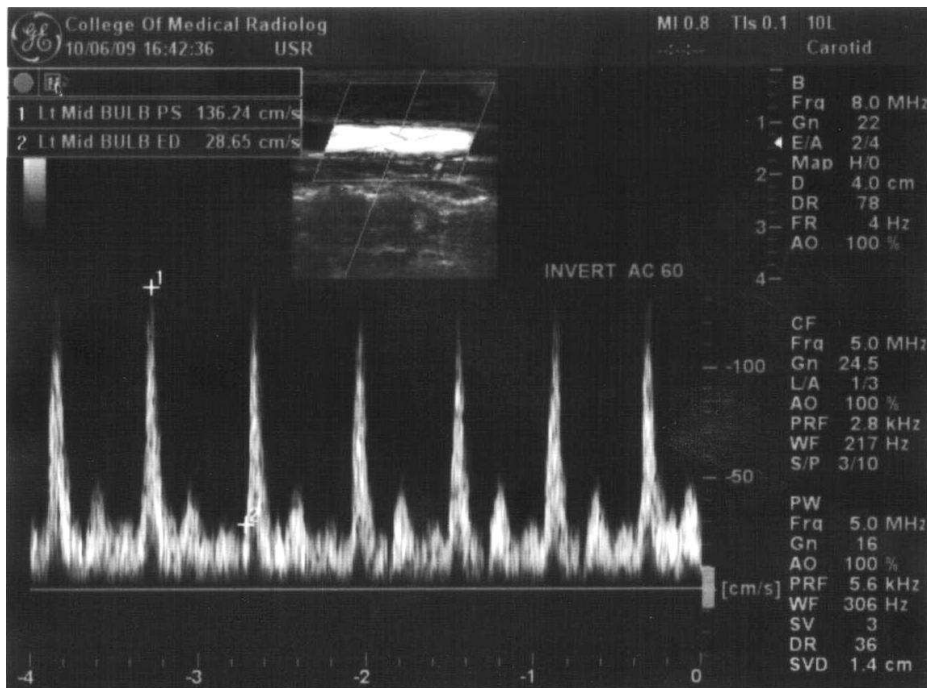
A.3 Rt CCA-Male-23 years-Current smoker (10 and more CPD) with IIMT-B-mode.

A.3 Rt CCA-Male-23 years- Current smoker (10 and more CPD) with IPSV and DEDV-Doppler Spectrum.

A.3 Lt CCA-Male-23 years-Current smoker (10 and more CPD) with IIMT-B-mode.

A.3 Lt CCA-Male-23 years- Current smoker (10 and more CPD) with IPSV and DEDV-Doppler Spectrum.

A.4 Rt CCA-Male-24 years-Former smoker (14 CPD) with IIMT-B-mode.
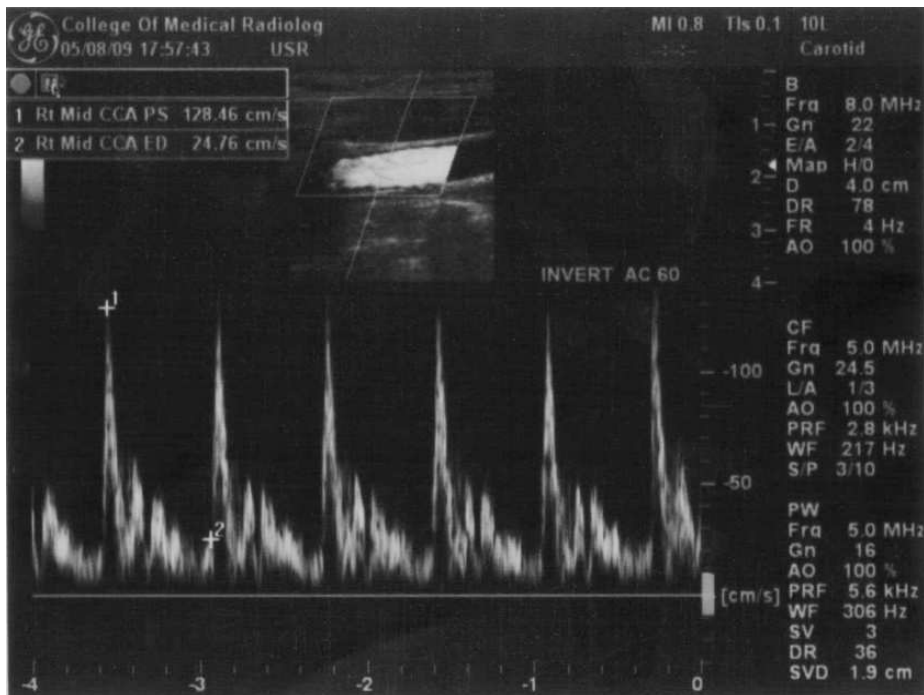
A.4 Rt CCA-Male-24 years- Former smoker (14 CPD) with IPSV and DEDV-Doppler Spectrum.

A.4 Lt CCA-Male-24 years-Former smoker (14 CPD) with IIMT-B-mode.

A.4 Lt CCA-Male-24 years- Former smoker (14 CPD) with IPSV and DEDV-Doppler Spectrum.

**A.5 Rt CCA-Male-24 years-Former smoker (6 CPD) with IIMT-B-mode.**

A.5 Rt CCA-Male-24 years- Former smoker (6 CPD) with IPSV and DEDV-Doppler Spectrum.

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A.5 Lt CCA-Male-24 years-Former smoker (6 CPD) with IIMT-B-mode.

A.5 Lt CCA-Male-24 years- Former smoker (6 CPD) with IPSV and DEDV-Doppler Spectrum.

A.6 Rt CCA-Male-28 years-Current smoker (15 CPD) with IIMT-B-mode.

A.6 Rt CCA-Male-28 years- Current smoker (15 CPD) with IPSV and DEDV-Doppler Spectrum.

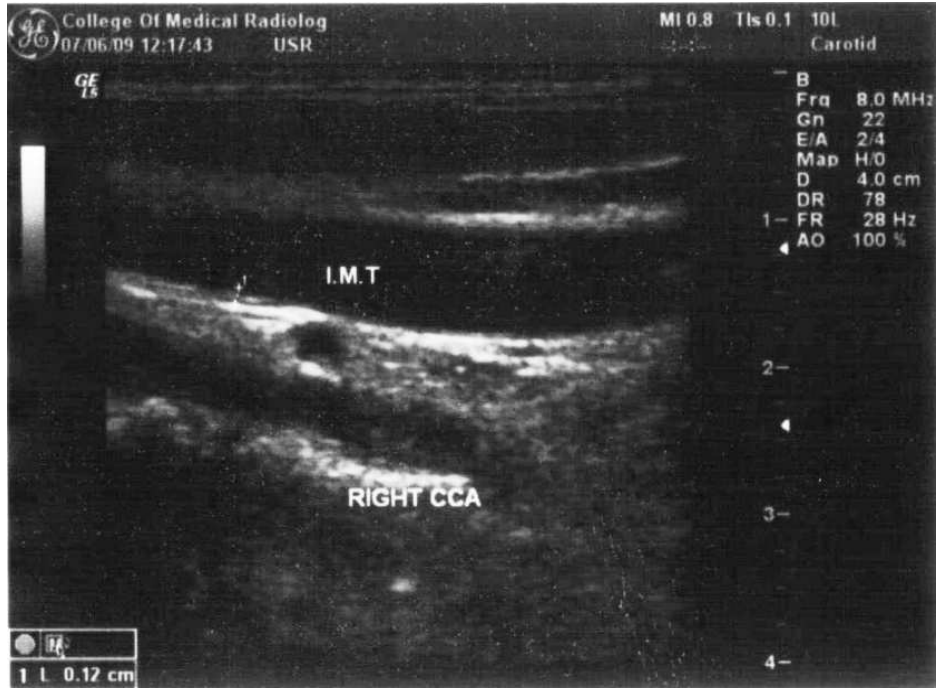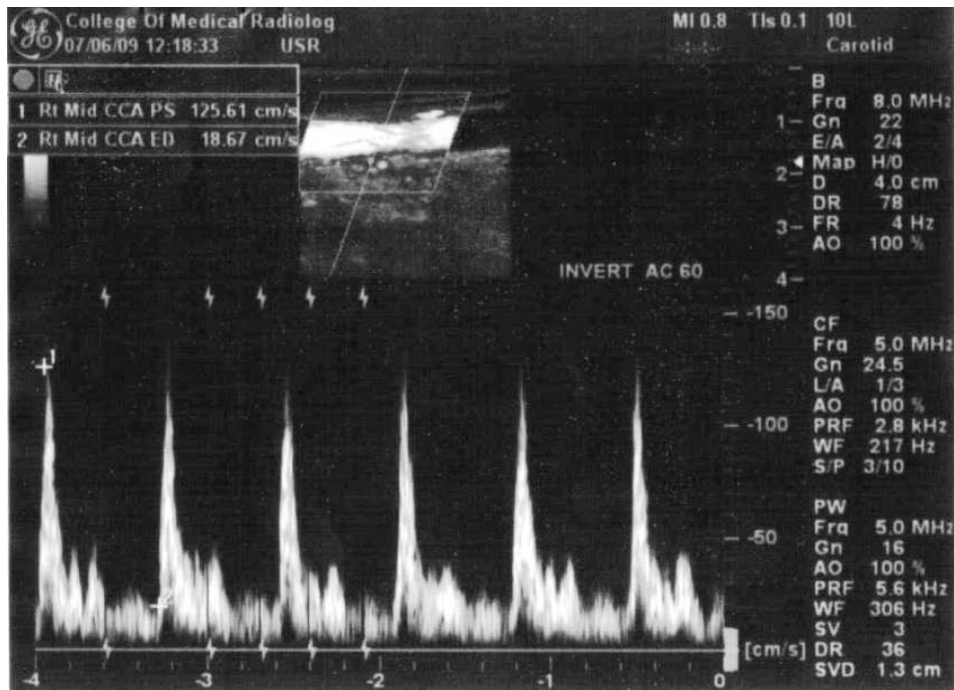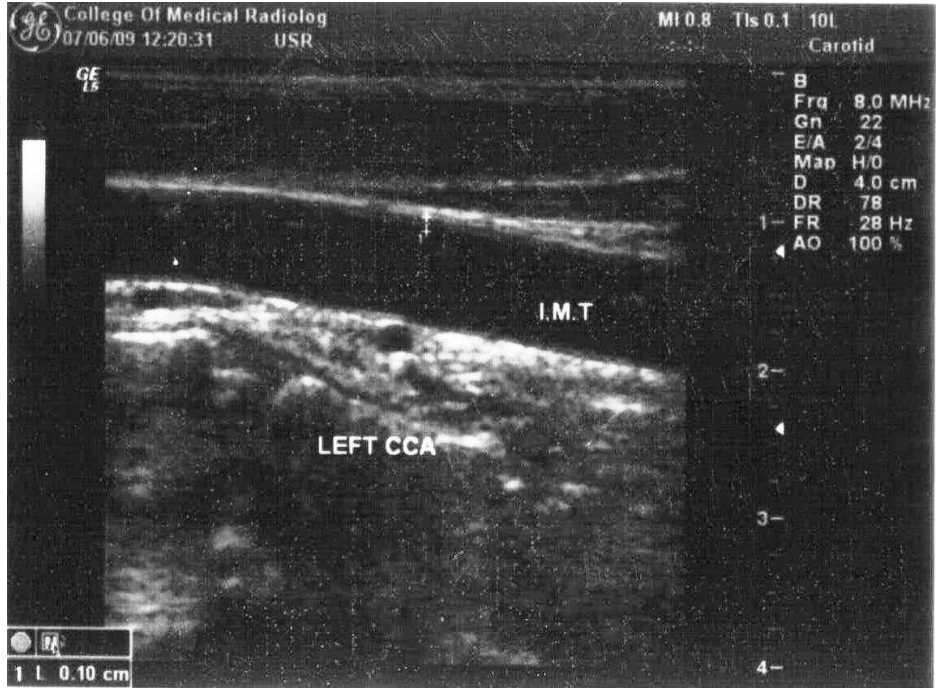**A.6 Lt CCA-Male-28 years-Current smoker (15 CPD) with IIMT-B-mode.**

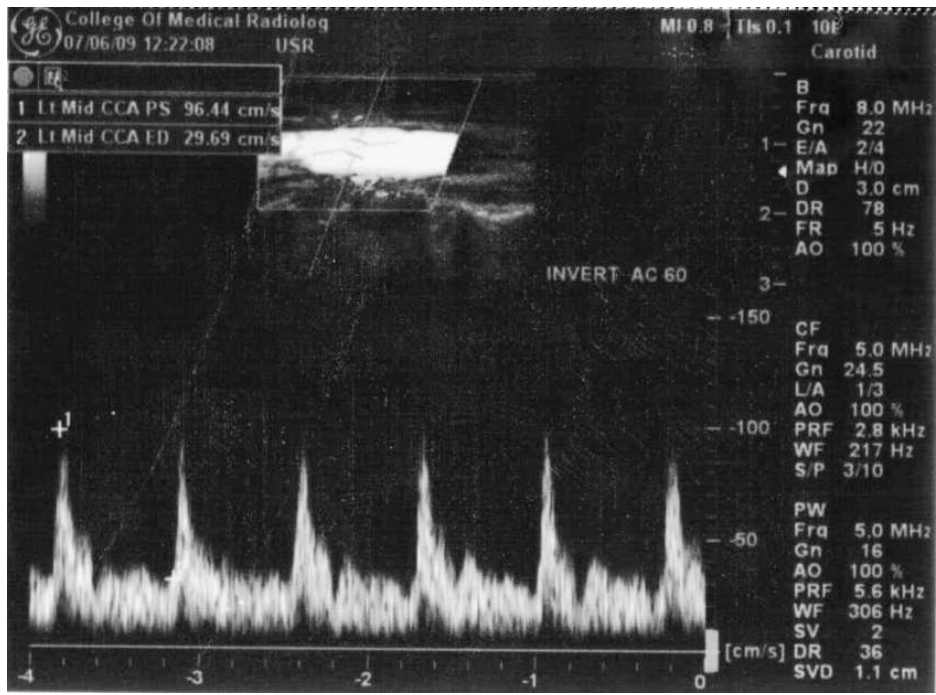**A.6 Lt CCA-Male-28 years- Current smoker (15 CPD) with IPSV and DEDV-Doppler Spectrum.**

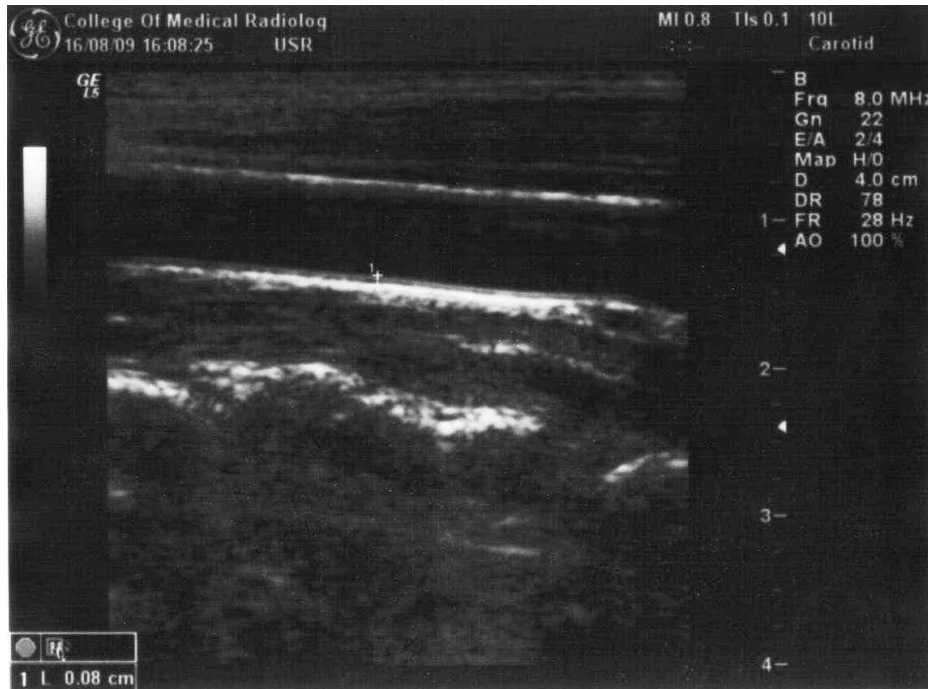**A.7 Rt CCA-Male-19 years-Current smoker (10 CPD) with IIMT-B-mode.**

A.7 Rt CCA-Male-19 years- Current smoker (10 CPD) with IPSV and DEDV-Doppler Spectrum.

A.7 Lt CCA-Male-19 years-Current smoker (10 CPD) with IIMT-B-mode.

A.7 Lt CCA-Male-19 years- Current smoker (10 CPD) with IPSV and DEDV-Doppler Spectrum.
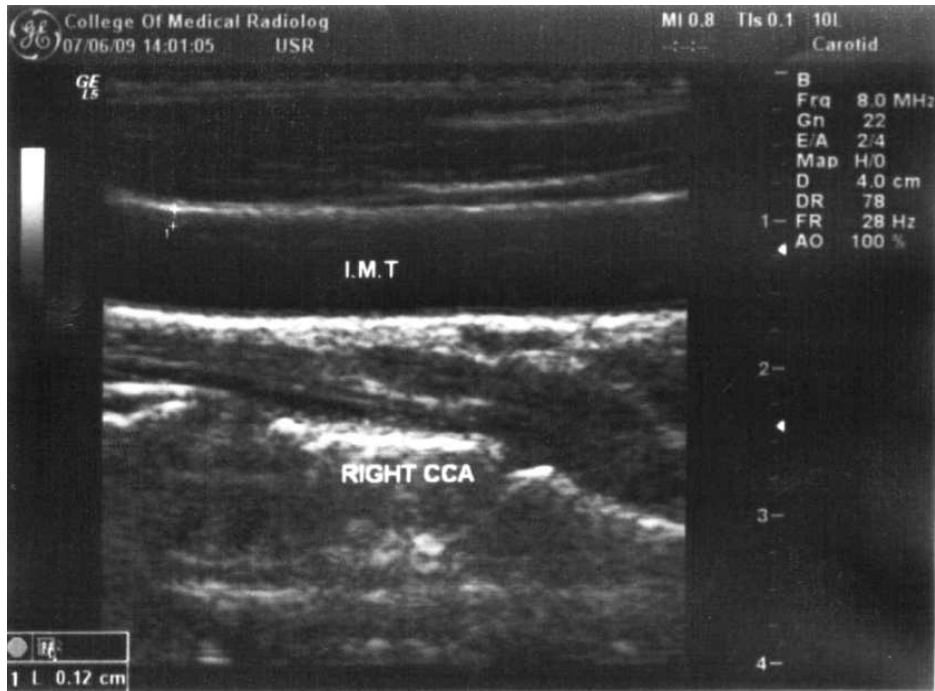
A.8 Rt CCA-Male-21 years-Current smoker (30 and more CPD) with IIMT-B-mode.

A.8 Rt CCA-Male-21 years- Current smoker (30 and more CPD) with IPSV and DEDV-Doppler Spectrum.
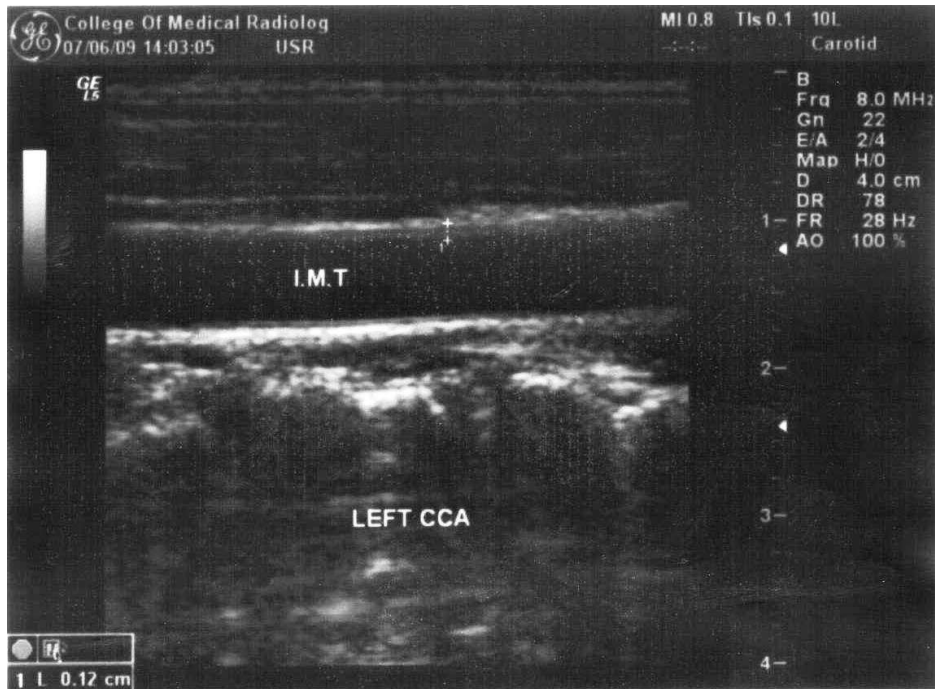
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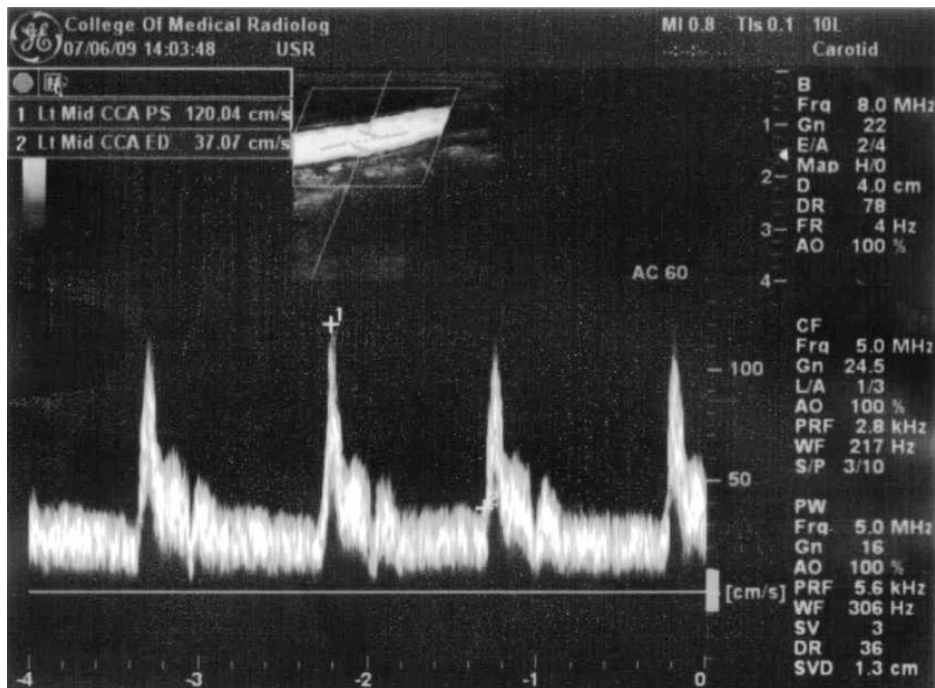
A.8 Lt CCA-Male-21 years- Current smoker (30 and more CPD) with IPSV and DEDV-Doppler Spectrum.

A.9 Rt CCA-Male-35 years-Current smoker (10-15 CPD) with IIMT-B-mode.

A.9 Rt CCA-Male-35 years- Current smoker (10-15 CPD) with IPSV and DEDV-Doppler Spectrum.

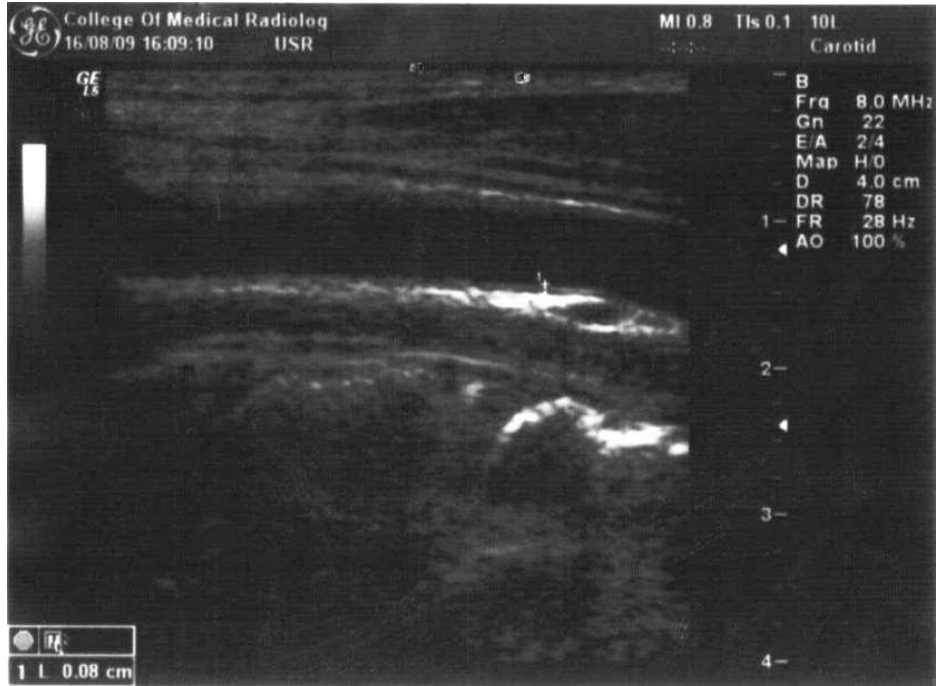**A.9 Lt CCA-Male-35 years-Current smoker (10-15 CPD) with IIMT-B-mode.**

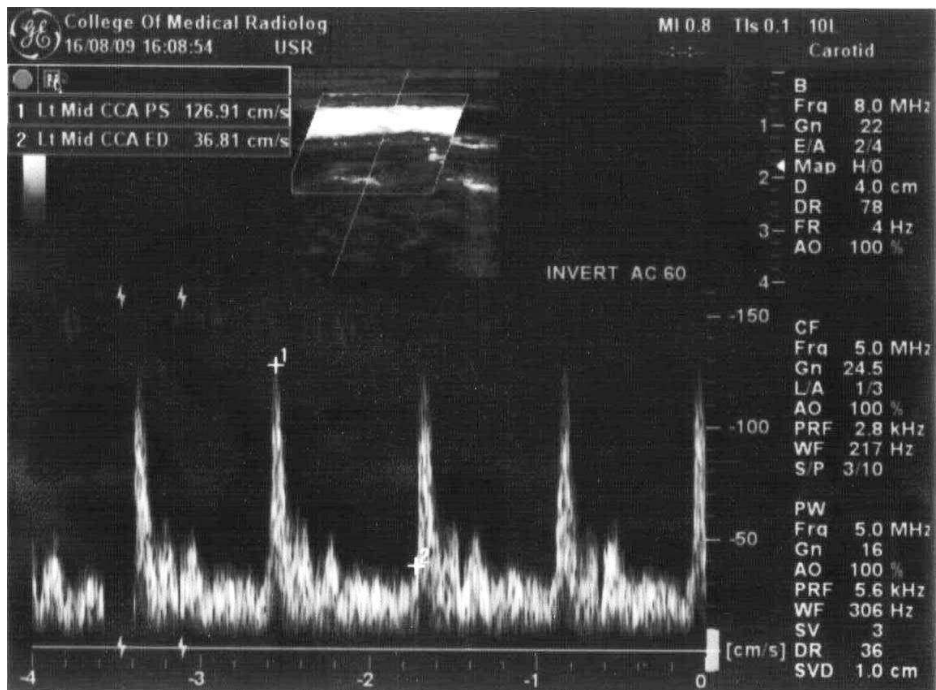**A.9 Lt CCA-Male-35 years- Current smoker (10-15 CPD) with IPSV and DEDV-Doppler Spectrum.**

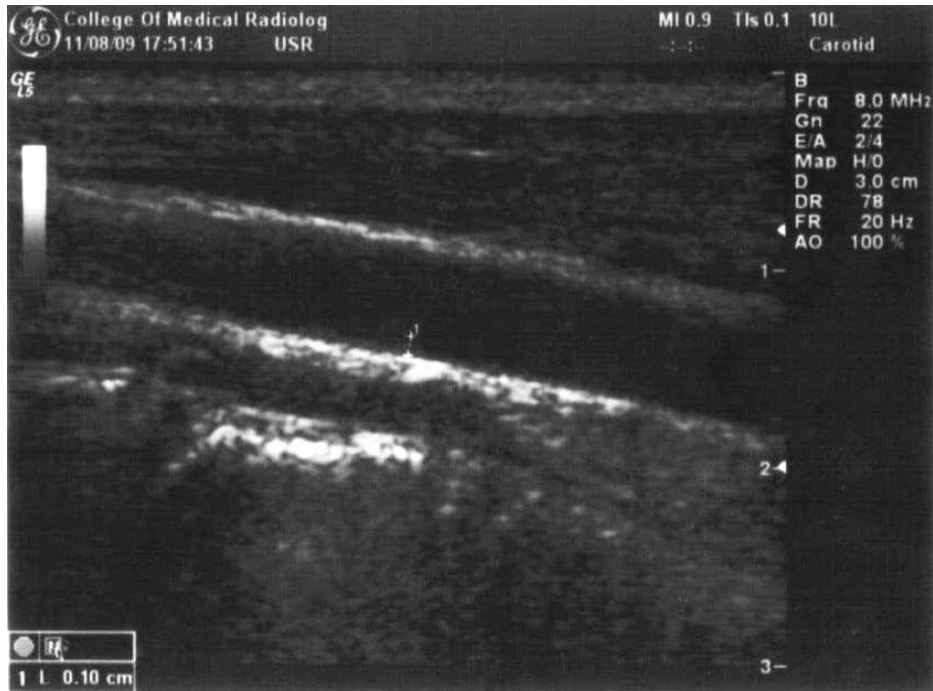**A.10 Rt CCA-Male-23 years-Current smoker (4 CPD) with IIMT-B-mode.**
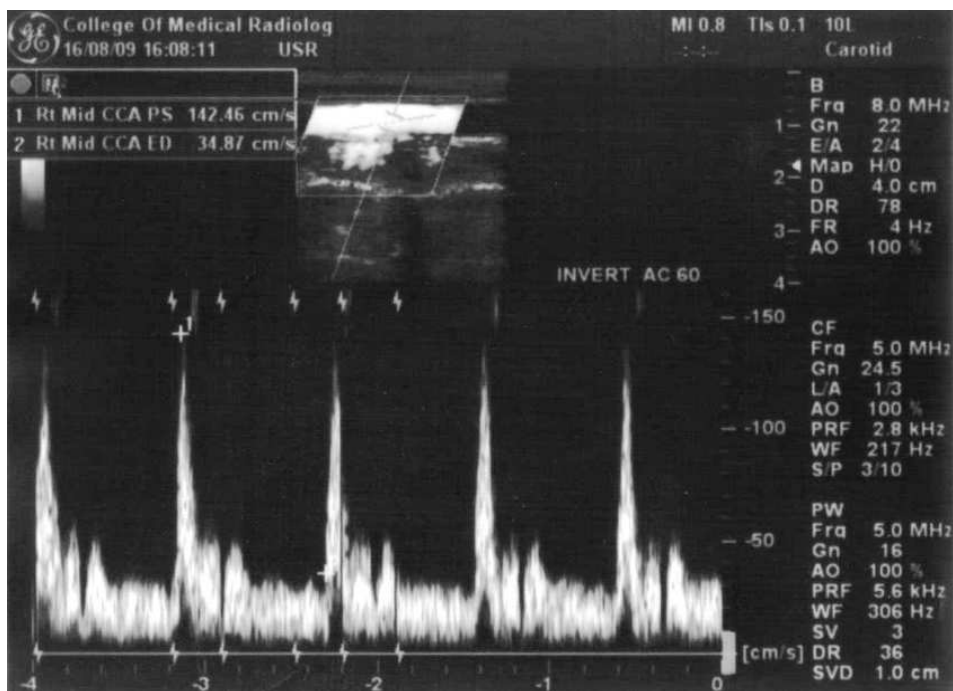
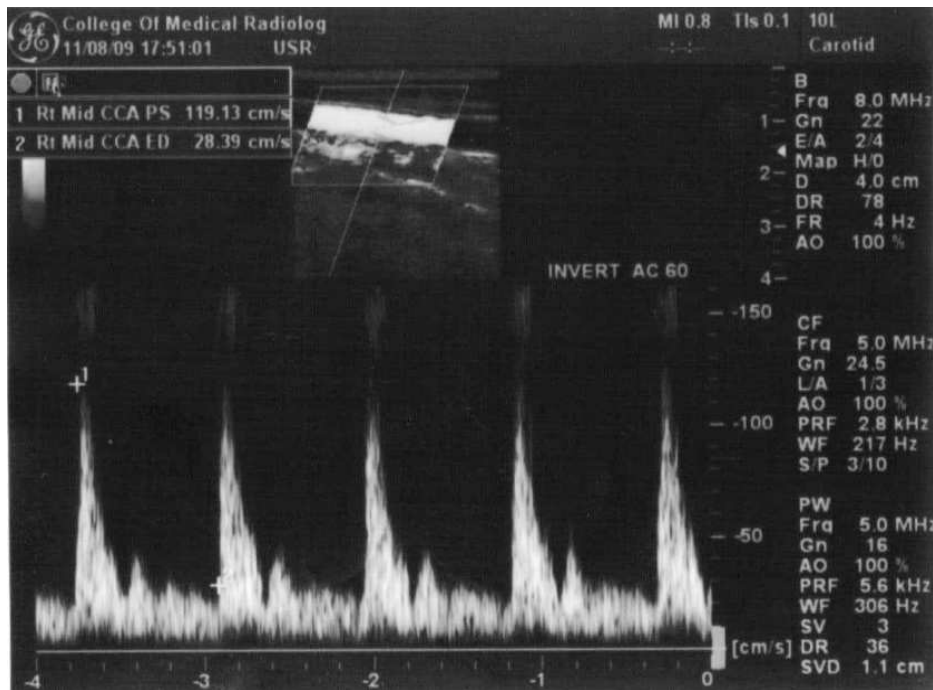**A.10 Rt CCA-Male-23 years- Current smoker (4 CPD) with IPSV and DEDV-Doppler Spectrum.**

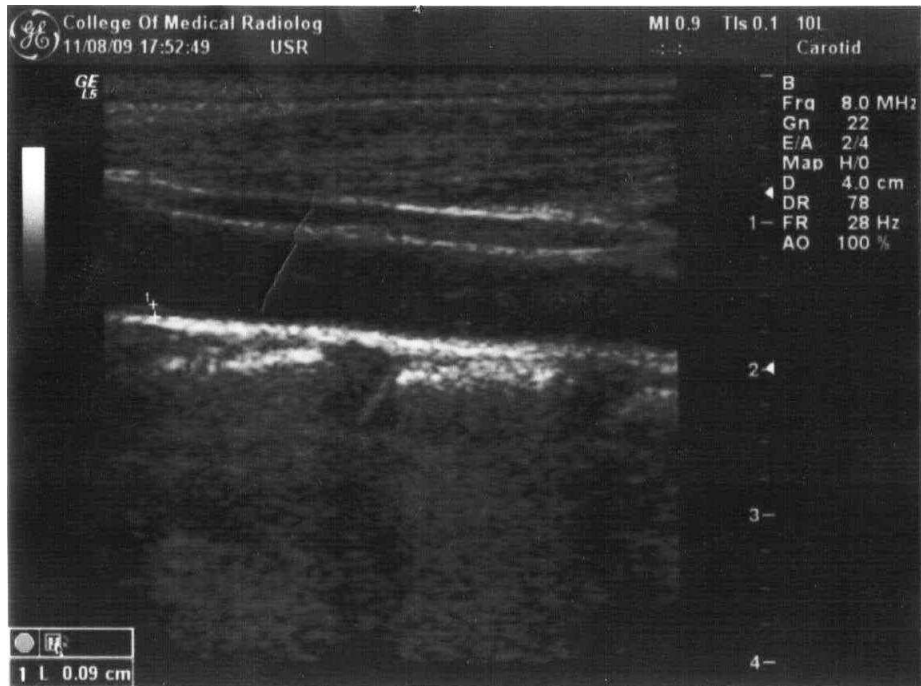**A.10 Lt CCA‑Male‑23 years‑Current smoker (4 CPD) with IIMT‑B‑mode.**

A.10 Lt CCA‑Male‑23 years‑ Current smoker (4 CPD) with IPSV and DEDV‑Doppler Spectrum.
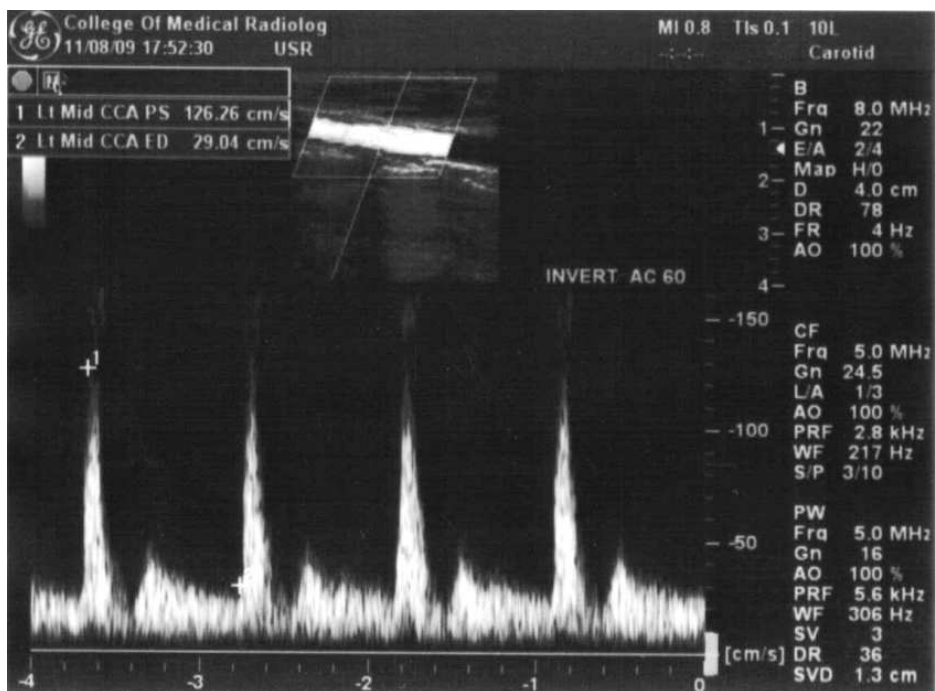
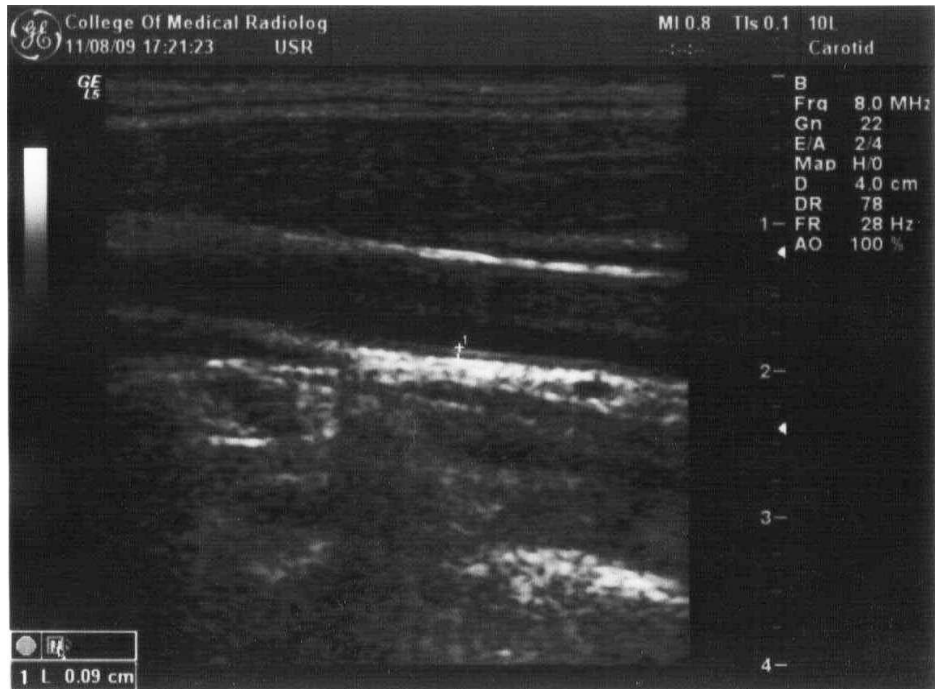**A.11 Rt CCA-Male-20 years-Current smoker (10 CPD) with IIMT-B-mode.**

A.11 Rt CCA-Male-20 years- Current smoker (10 CPD) with IPSV and DEDV-Doppler Spectrum.
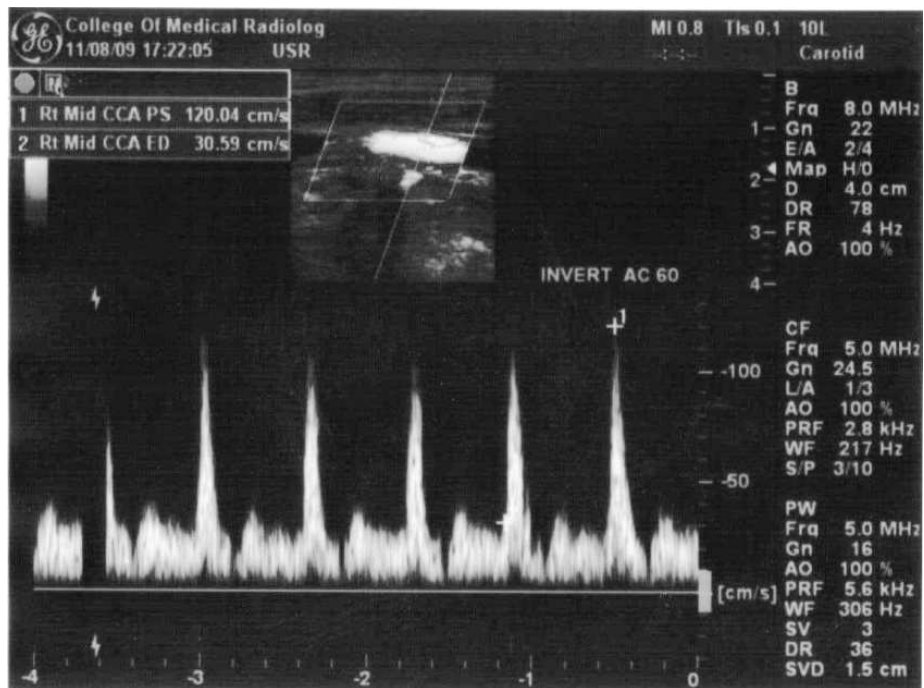
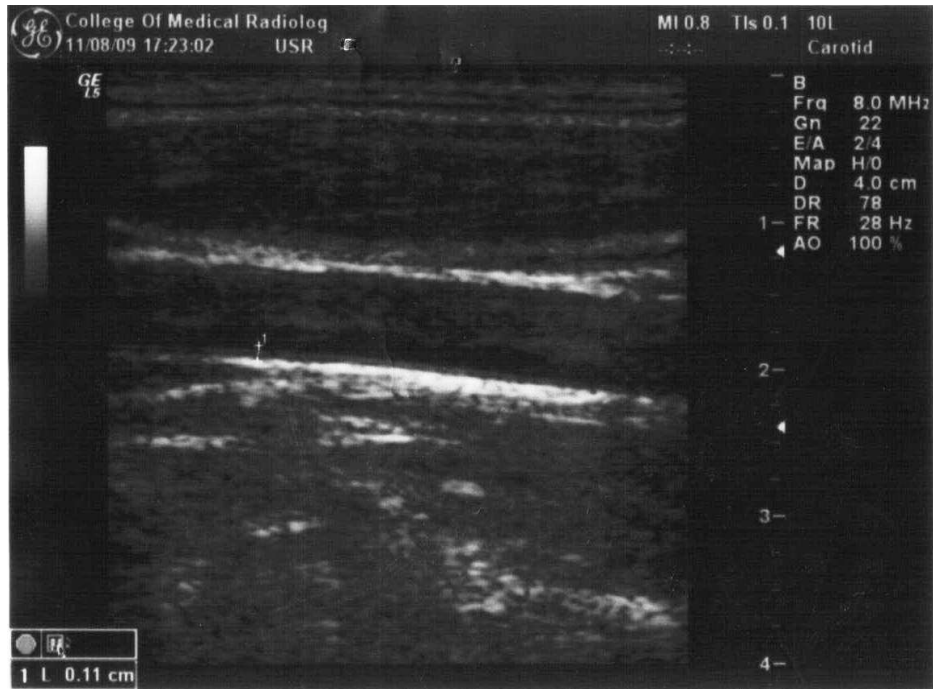**A.11 Lt CCA-Male-20 years-Current smoker (10 CPD) with IIMT-B-mode.**

A.11 Lt CCA-Male-20 years- Current smoker (10 CPD) with IPSV and DEDV-Doppler Spectrum.
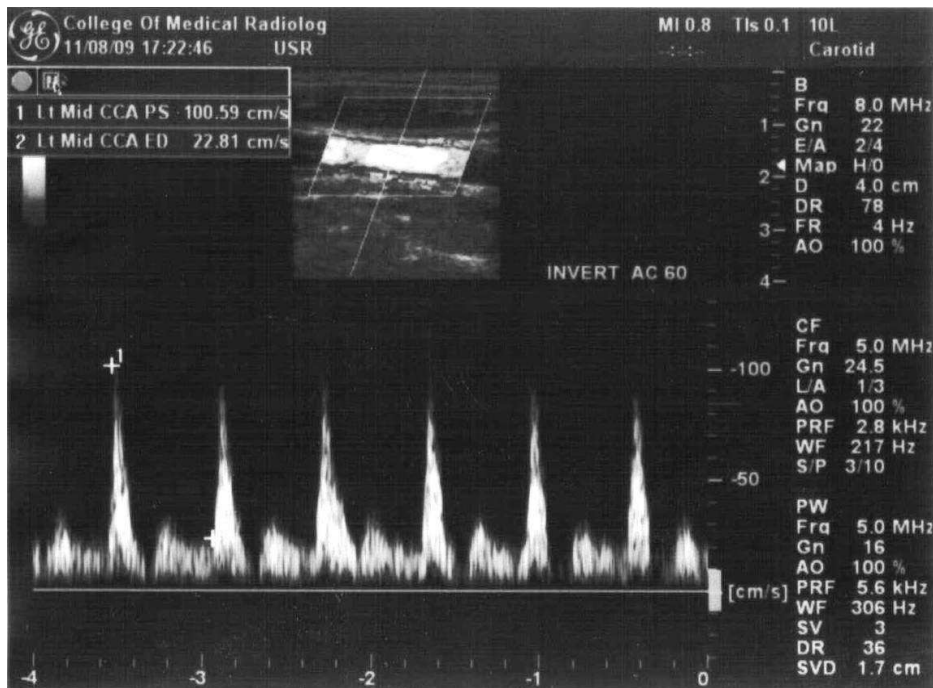
A.12 Rt CCA-Male-20 years-Current smoker (2-3 CPD) with IIMT-B-mode.
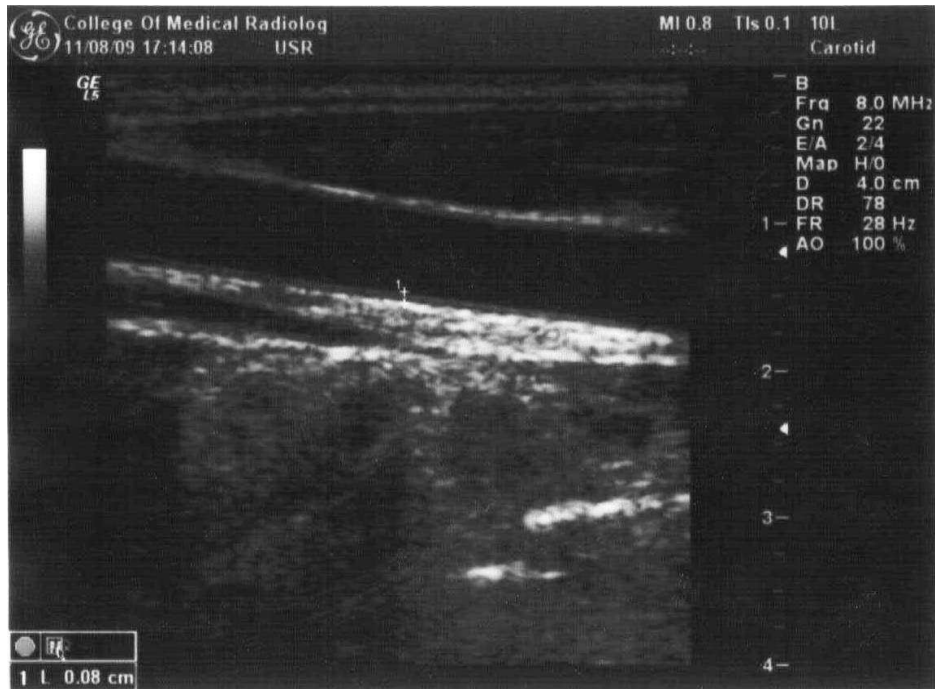

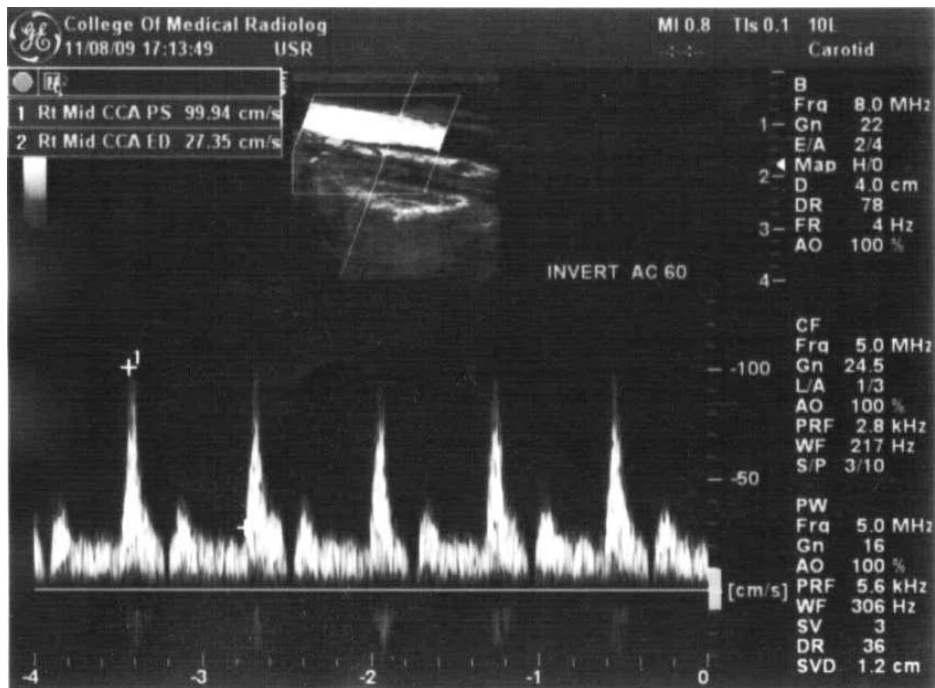**A.12 Rt CCA-Male-20 years- Current smoker (2-3 CPD) with IPSV and DEDV-Doppler Spectrum.**

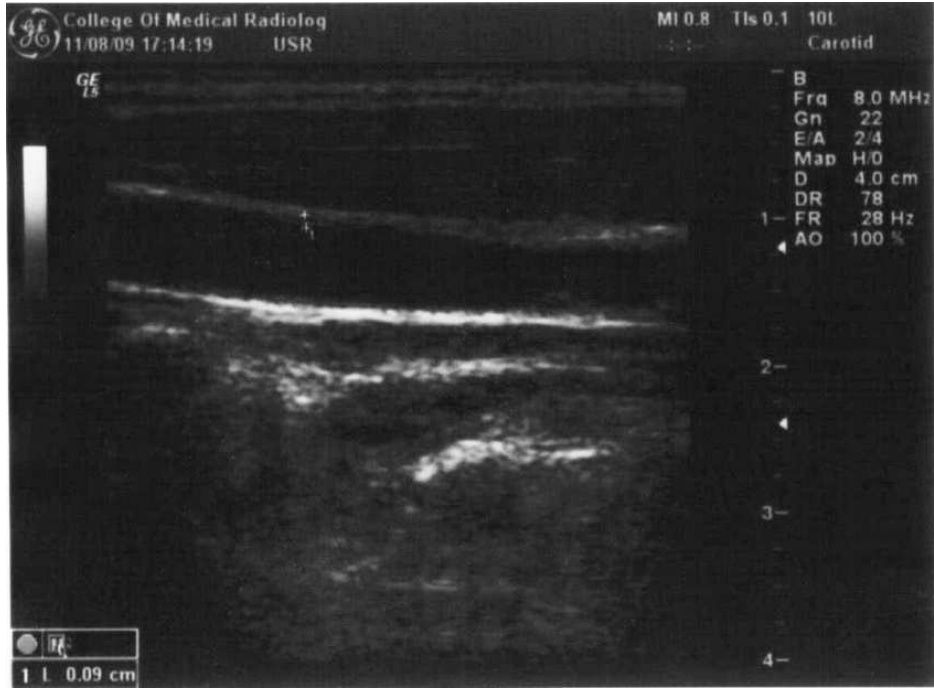**A.12 Lt CCA-Male-20 years-Current smoker (2-3 CPD) with IIMT-B-mode.**

A.12 Lt CCA-Male-20 years- Current smoker (2-3 CPD) with IPSV and DEDV-Doppler Spectrum.

A.13 Rt CCA-Male-22 years-Former smoker (7-8 CPD) with IIMT-B-mode.

A.13 Rt CCA-Male-22 years- Former smoker (7-8 CPD) with IPSV and DEDV-Doppler Spectrum.
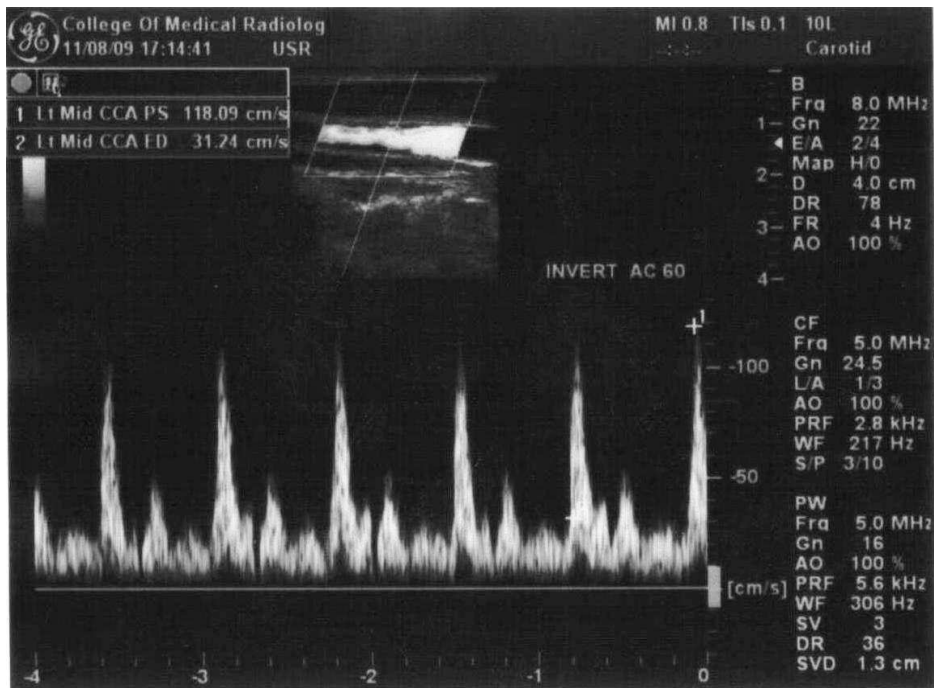
A.13 Lt CCA-Male-22 years-Former smoker (7-8 CPD) with IIMT-B-mode.

A.13 Lt CCA-Male-22 years- Former smoker (7-8 CPD) with IPSV and DEDV-Doppler Spectrum.

A.14 Rt CCA-Male-22 years-Current smoker (5 CPD) with IIMT-B-mode.

A.14 Rt CCA-Male-22 years- Current smoker (5 CPD) with IPSV and DEDV-Doppler Spectrum.

A.14 Lt CCA-Male-22 years-Current smoker (5 CPD) with IIMT-B-mode.

A.14 Lt CCA-Male-22 years- Current smoker (5 CPD) with IPSV and DEDV-Doppler Spectrum.

A.15 Rt CCA-Male-29 years-Current smoker (2 CPD) with IIMT-B-mode.
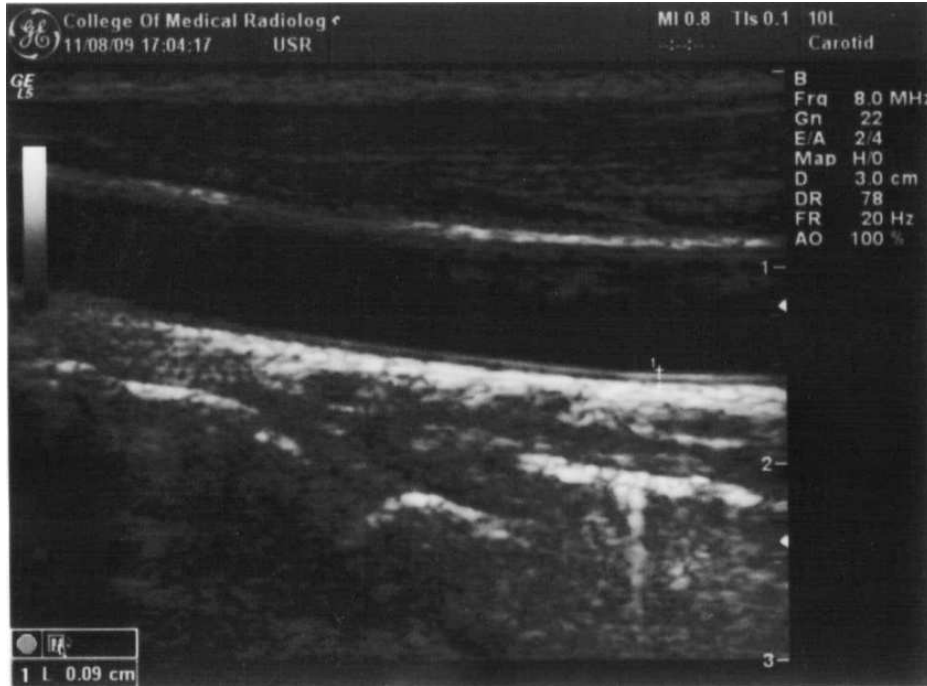

A.15 Rt CCA-Male-29 years- Current smoker (2 CPD) with IPSV and DEDV-Doppler Spectrum.

A.15 Lt CCA-Male-29 years-Current smoker (2 CPD) with IIMT-B-mode.

A.15 Lt CCA-Male-29 years- Current smoker (2 CPD) with IPSV and DEDV-Doppler Spectrum.

A.16 Rt CCA-Male-21 years-Former smoker (2-3 CPD) with IIMT-B-mode.

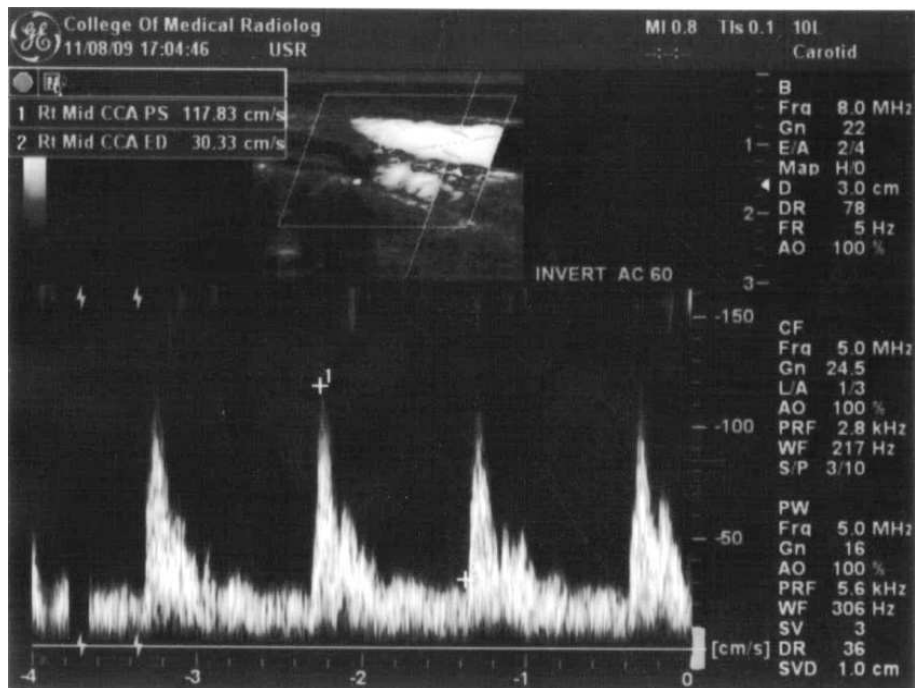**A.16 Rt CCA-Male-21 years- Former smoker (2-3 CPD) with IPSV and DEDV-Doppler Spectrum.**

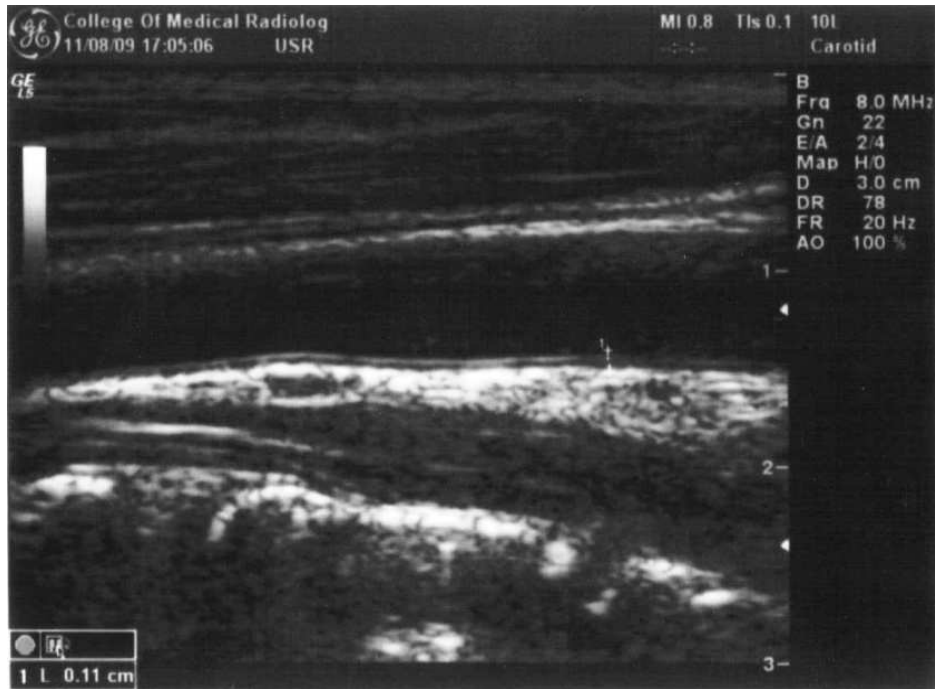**A.16 Lt CCA-Male-21 years-Former smoker (2-3 CPD) with IIMT-B-mode.**

A.16 Lt CCA-Male-21 years- Former smoker (2-3 CPD) with IPSV and DEDV-Doppler Spectrum.
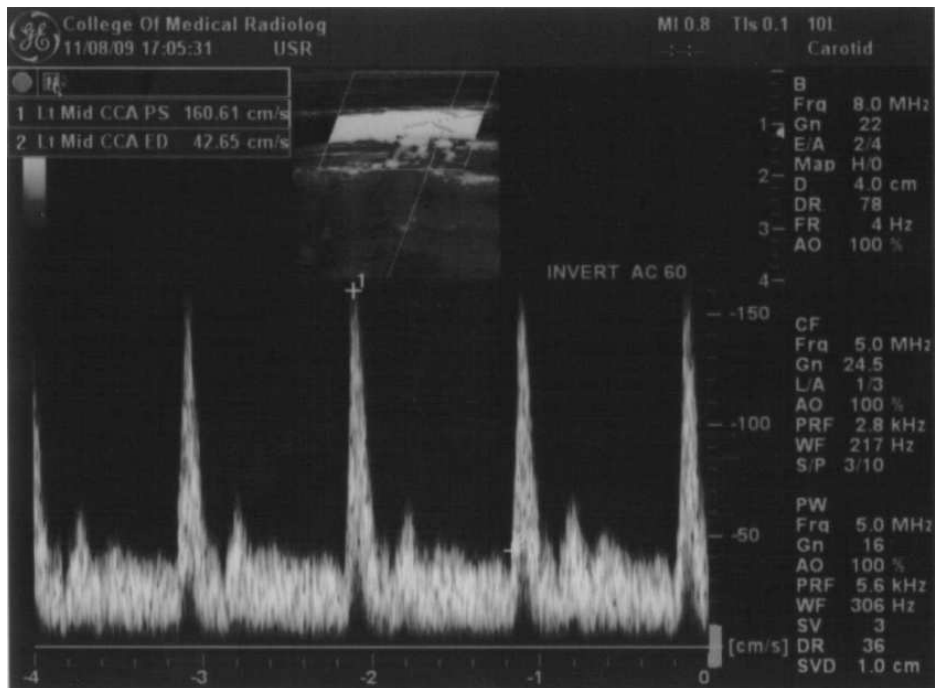
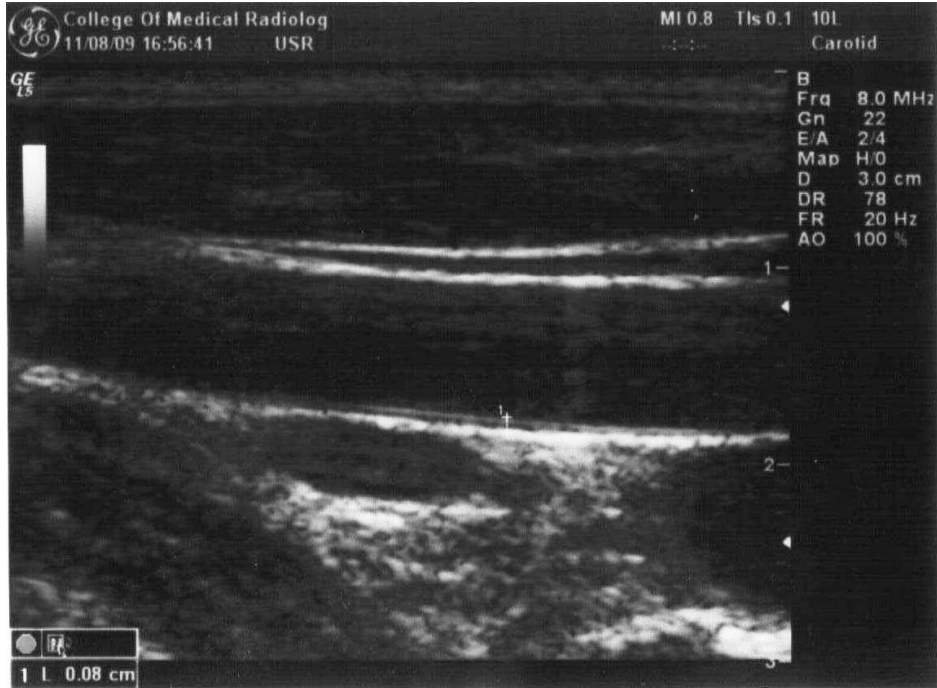**A.17 Rt CCA-Male-23 years-Current smoker (10 CPD) with IIMT-B-mode.**

A.17 Rt CCA-Male-23 years- Current smoker (10 CPD) with IPSV and DEDV-Doppler Spectrum.
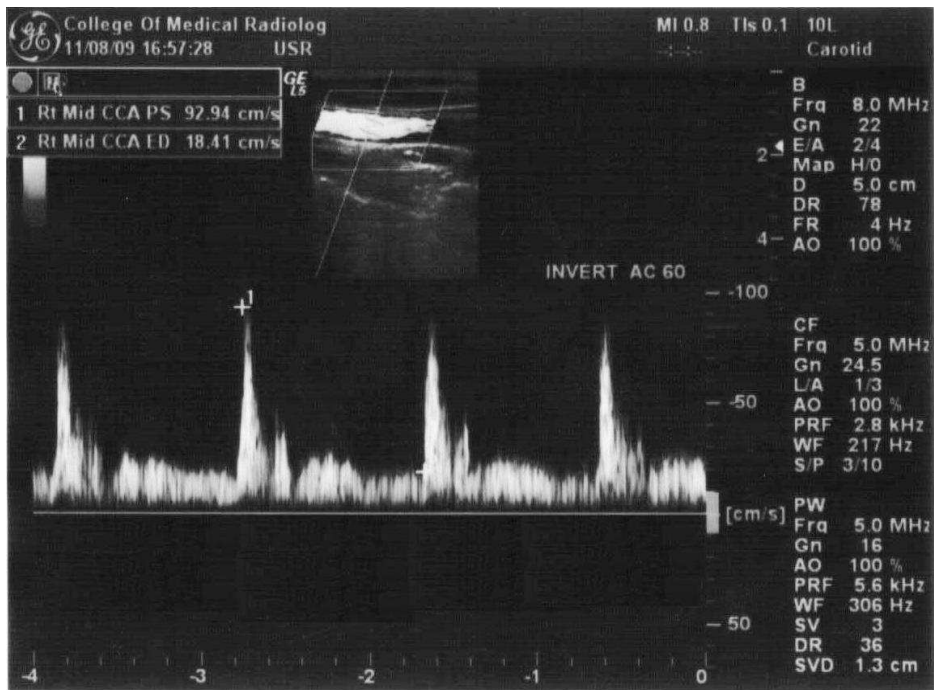
A.17 Lt CCA-Male-23 years-Current smoker (10 CPD) with IIMT-B-mode.
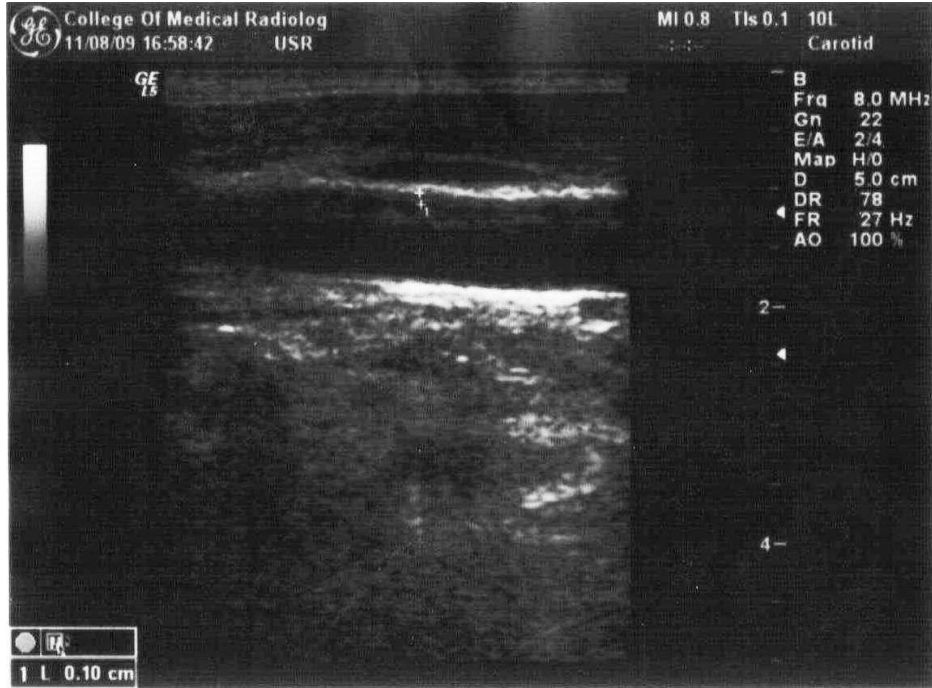

A.17 Lt CCA-Male-23 years- Current smoker (10 CPD) with IPSV and DEDV-Doppler Spectrum.

A.18 Rt CCA-Male-35 years-Current smoker (1 CPD) with IIMT-B-mode.

A.18 Rt CCA-Male-35 years- Current smoker (1 CPD) with IPSV and DEDV-Doppler Spectrum.

A.18 Lt CCA-Male-35 years-Current smoker (1 CPD) with IIMT-B-mode.

A.18 Lt CCA-Male-35 years- Current smoker (1 CPD) with IPSV and DEDV-Doppler Spectrum.
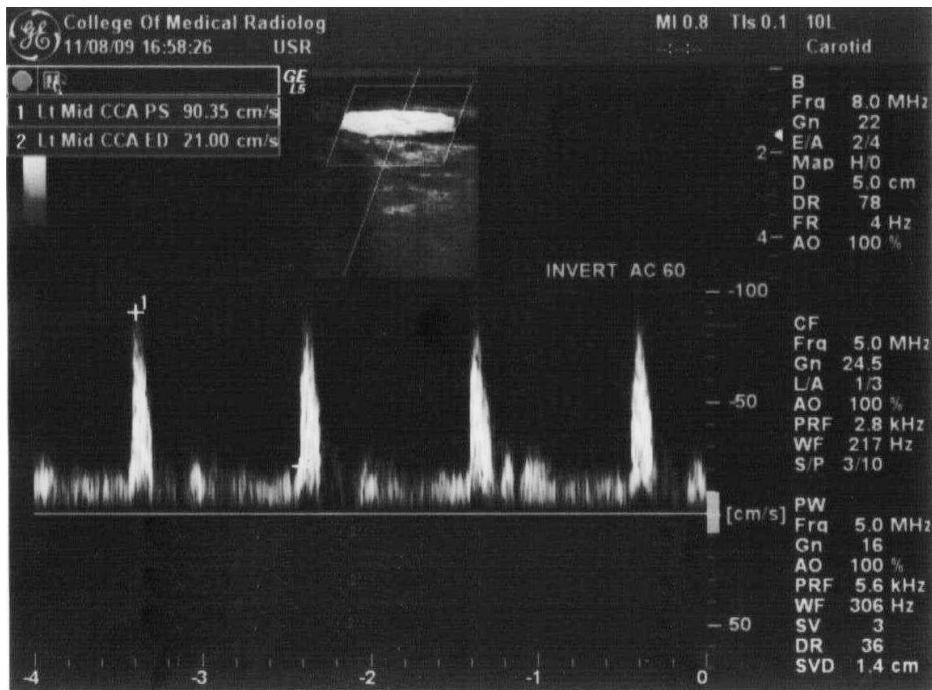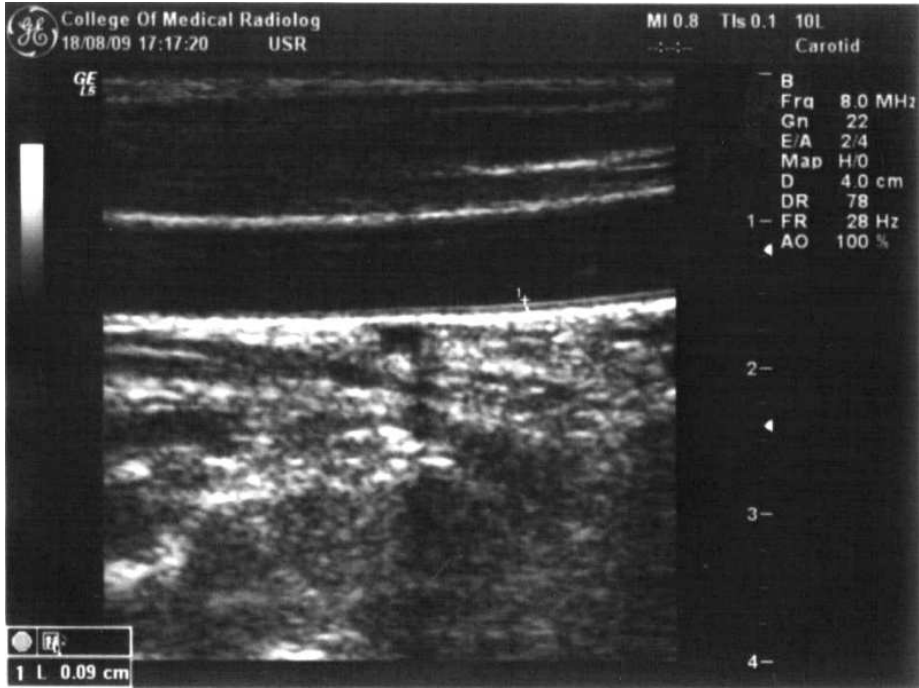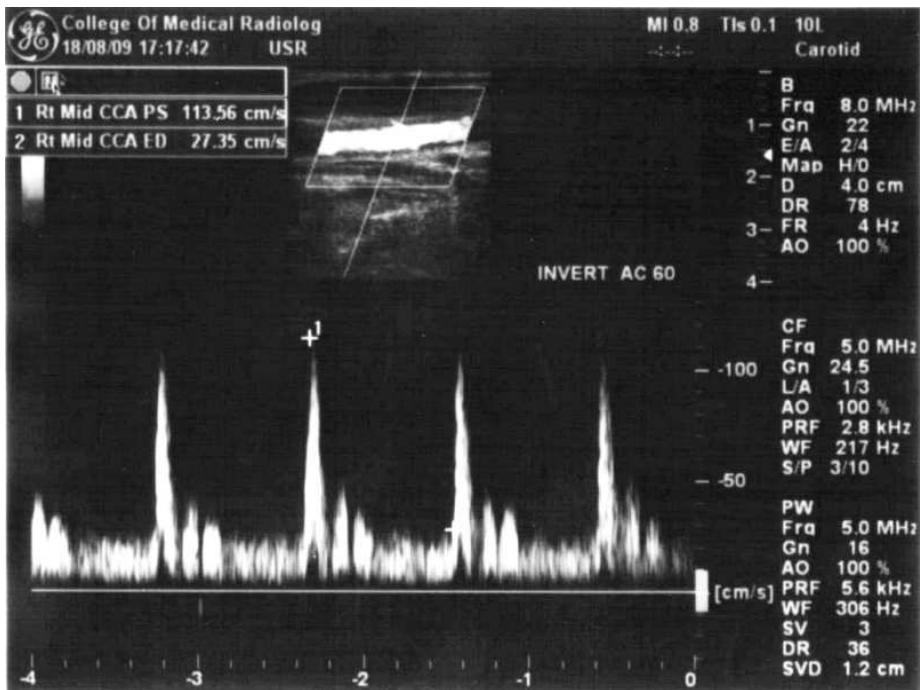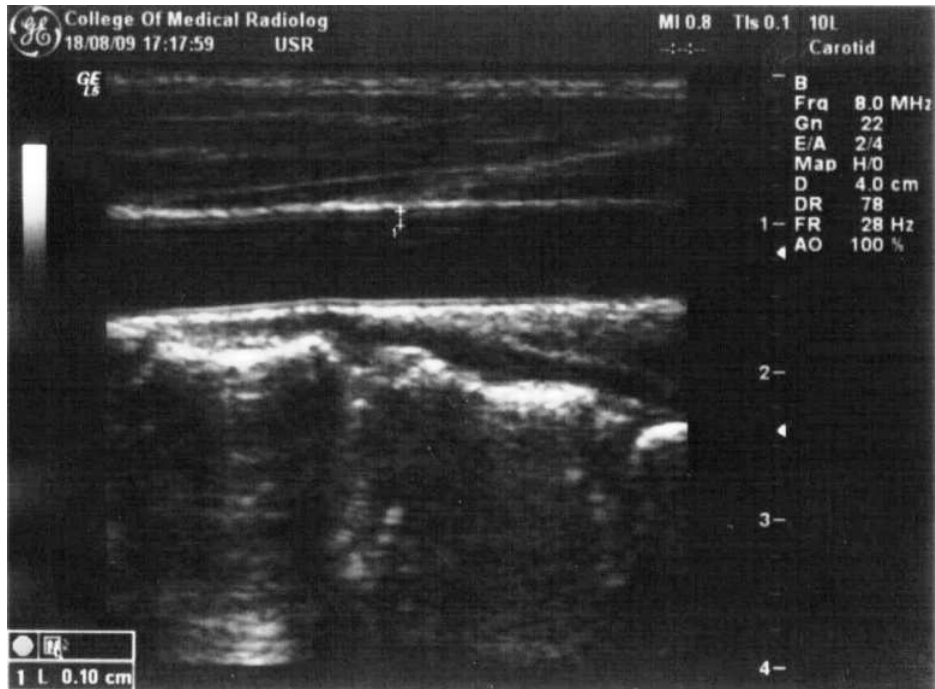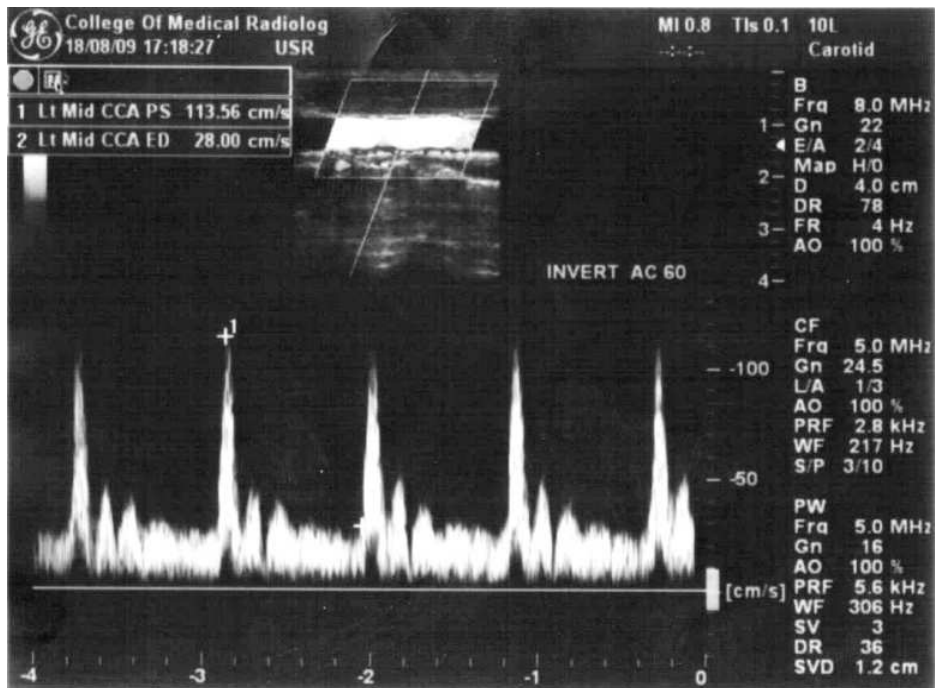
A.19 Rt CCA-Male-21 years-Current smoker (10 and more CPD) with IIMT-B-mode.

A.19 Rt CCA-Male-21 years- Current smoker (10 AND MORE CPD) with IPSV and DEDV-Doppler Spectrum.

Figure 1A.19 Lt CCA-Male-21 years-Current smoker (10 and more CPD) with IIMT-B-mode.

A.19 Lt CCA-Male-21 years- Current smoker (10 AND MORE CPD) with IPSV and DEDV-Doppler Spectrum.
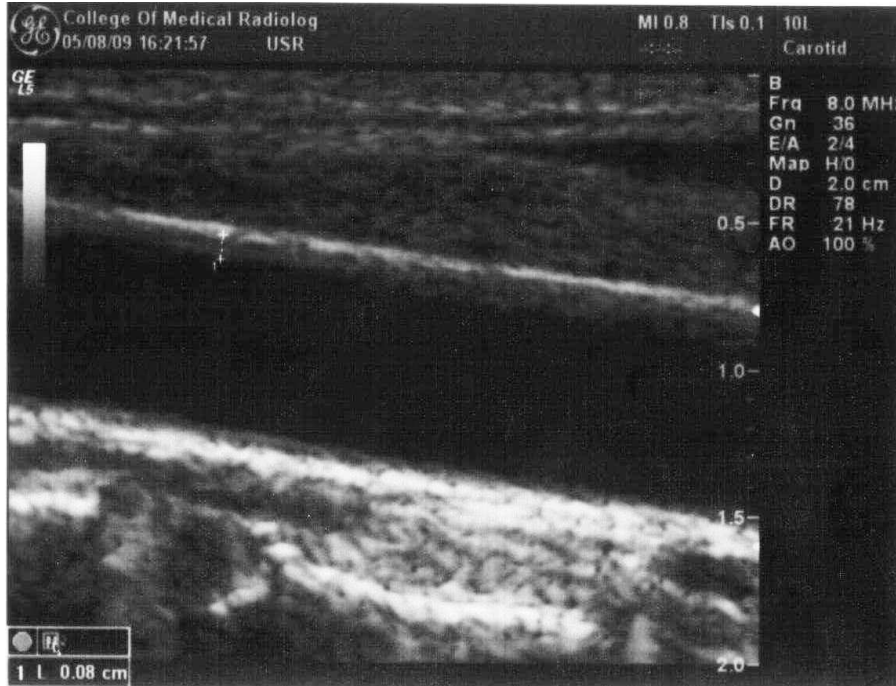
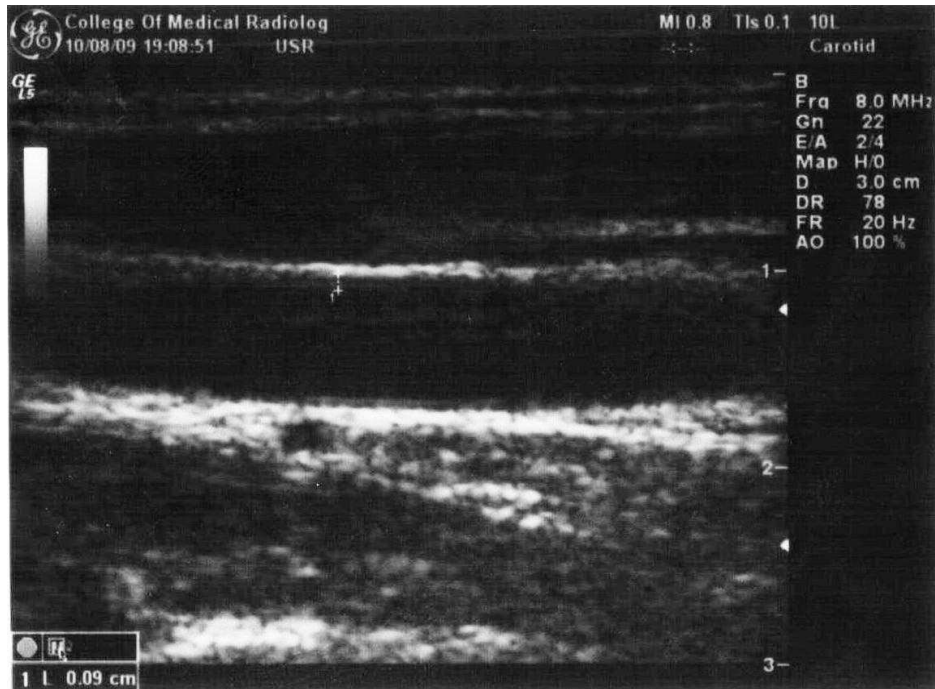**A.20 Rt CCA-Male-23 years-Former smoker (1 CPD) with IIMT-B-mode.**
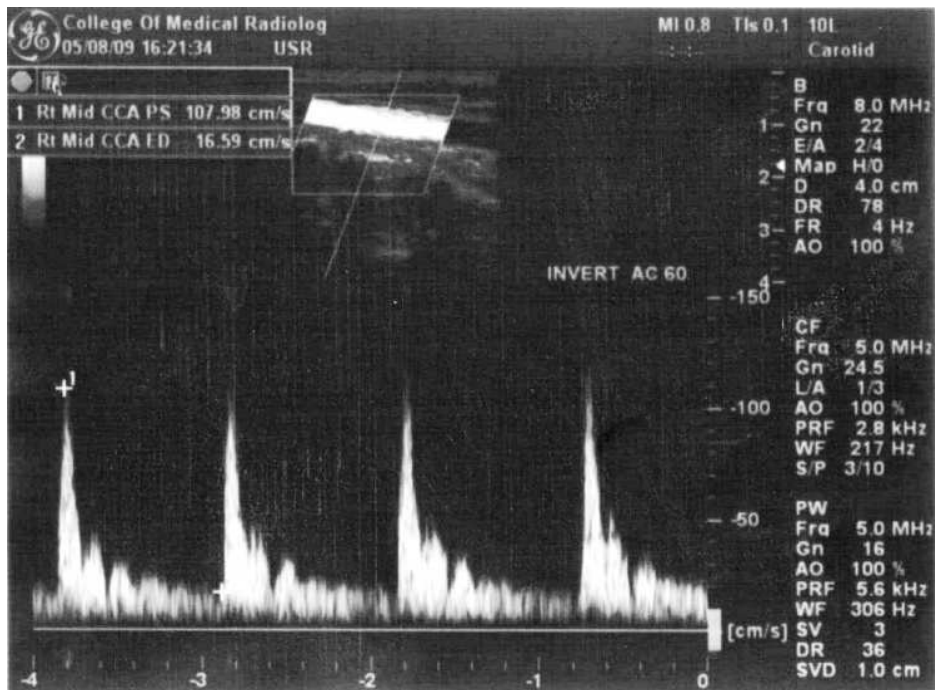
A.20 Rt CCA-Male-23 years- Former smoker (1 CPD) with IPSV and DEDV-Doppler Spectrum.
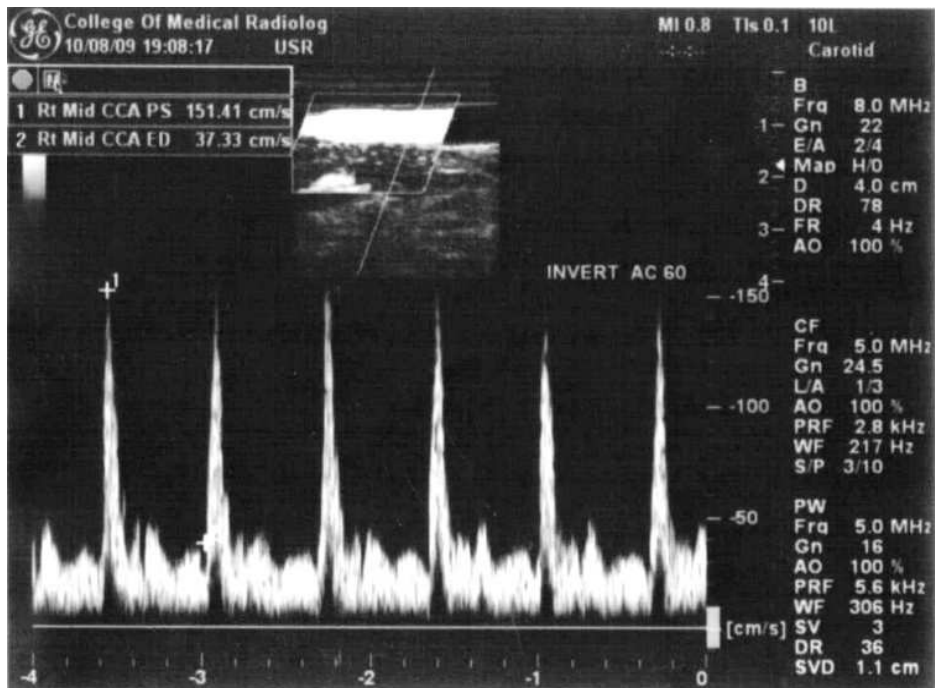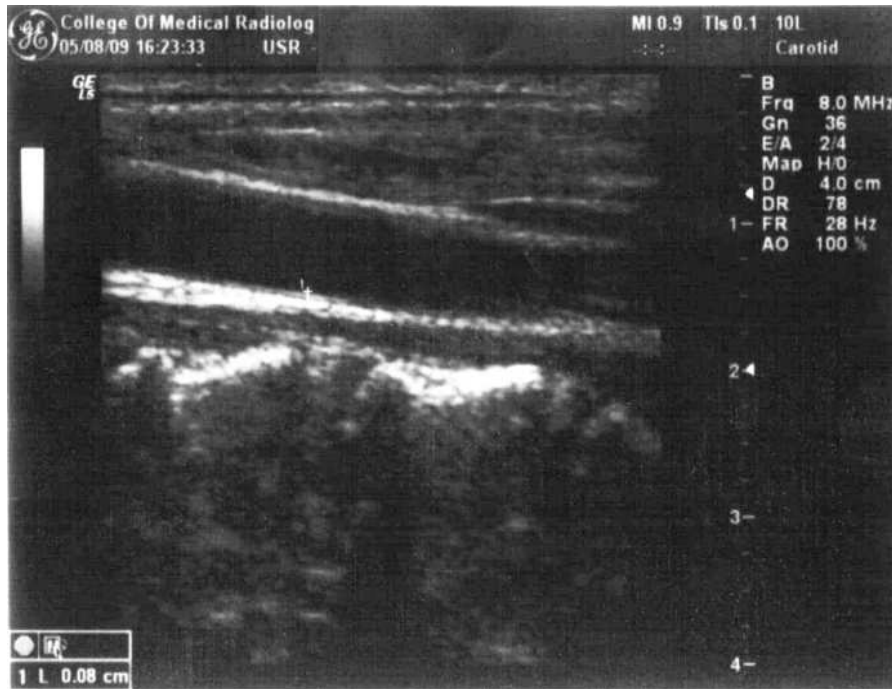
A.20 Lt CCA-Male-23 years-Former smoker (1 CPD) with IIMT-B-mode.
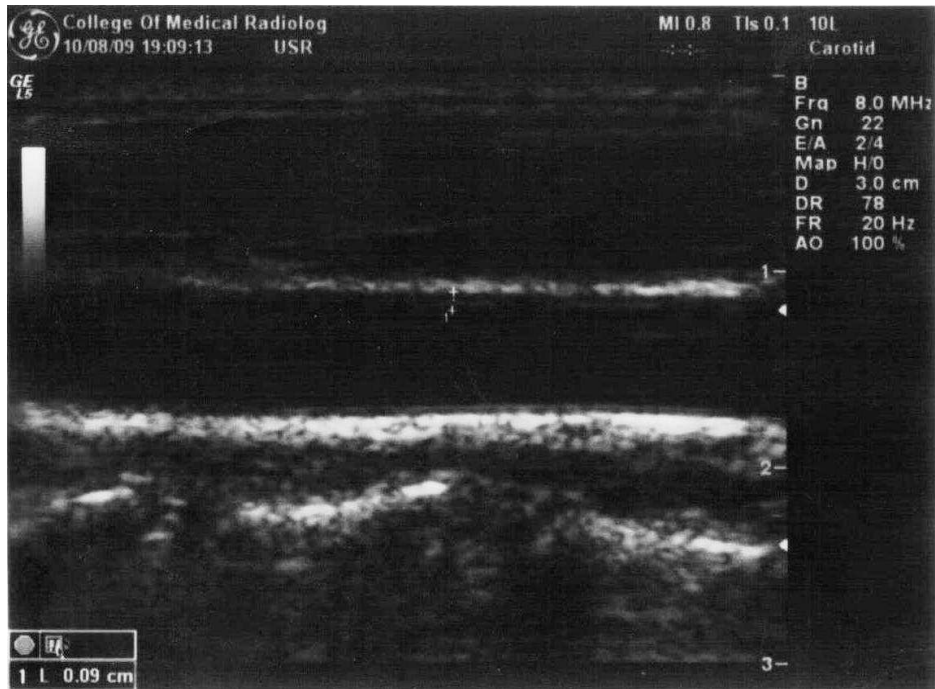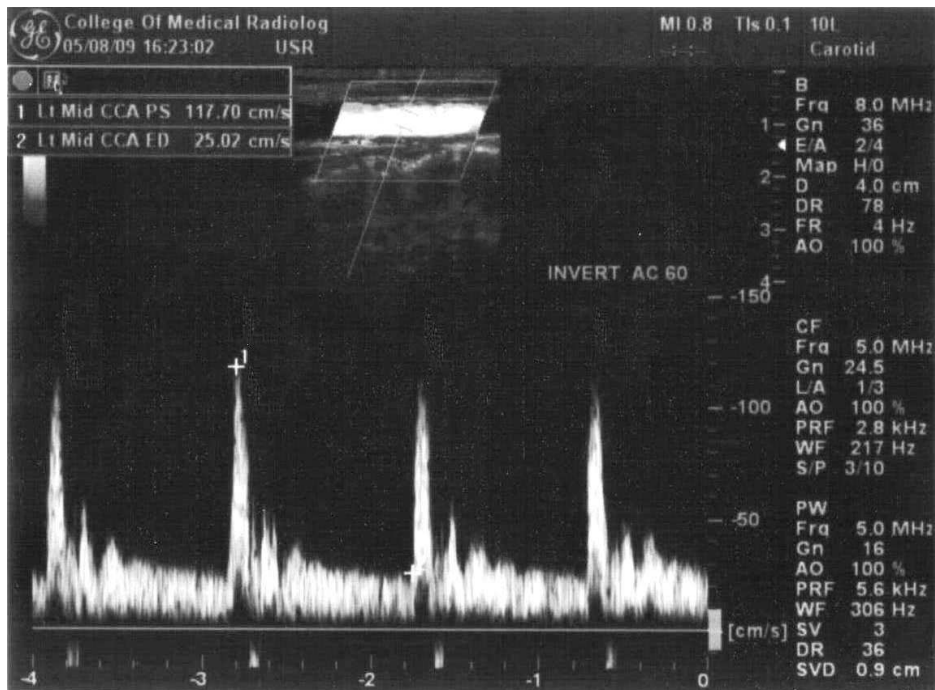

A.20 Lt CCA-Male-23 years- Former smoker (1 CPD) with IPSV and DEDV-Doppler Spectrum.
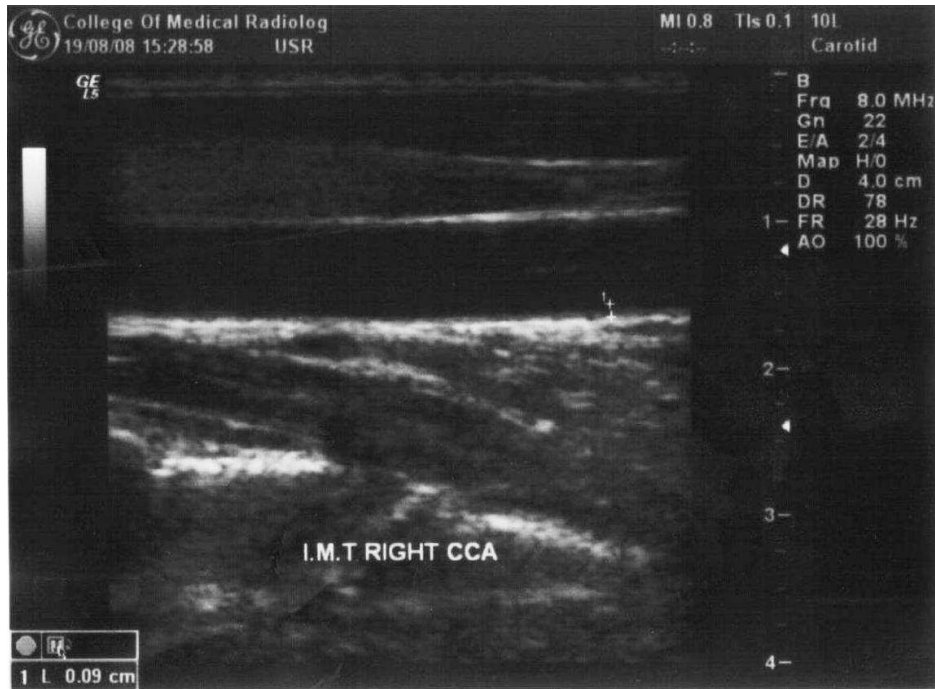
A.21 Rt CCA-Male-28 years-Former smoker (10 and more CPD) with IIMT-B-mode.
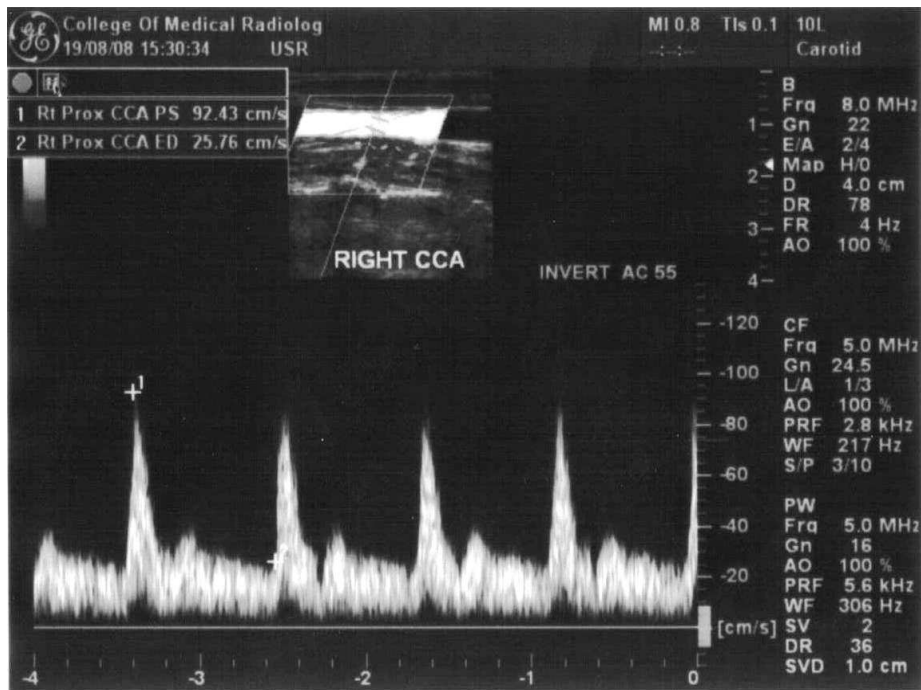
A.21 Rt CCA-Male-28 years- Former smoker (10and more CPD) with IPSV and DEDV-Doppler Spectrum.
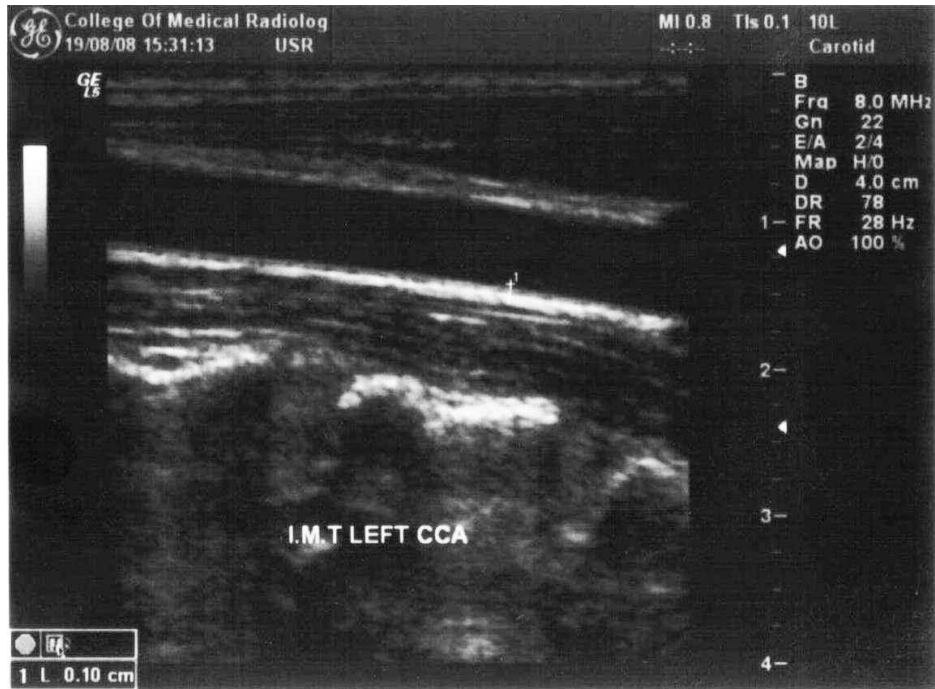
A.21 Lt CCA-Male-28 years-Former smoker (10 and more CPD) with IIMT-B-mode.
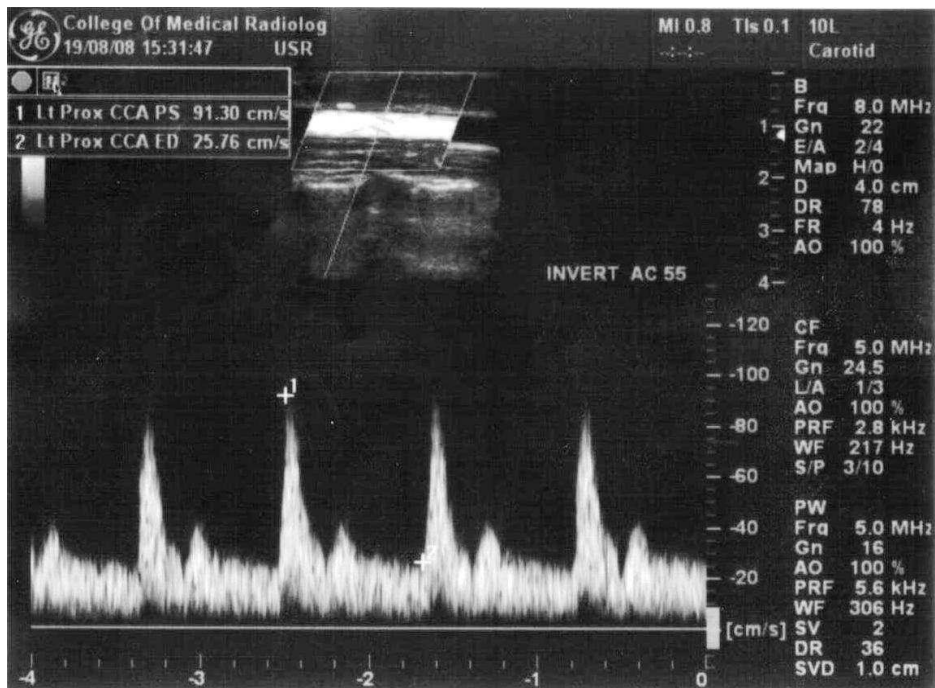
A.21 Lt CCA-Male-28 years- Former smoker (10and more CPD) with IPSV and DEDV-Doppler Spectrum.
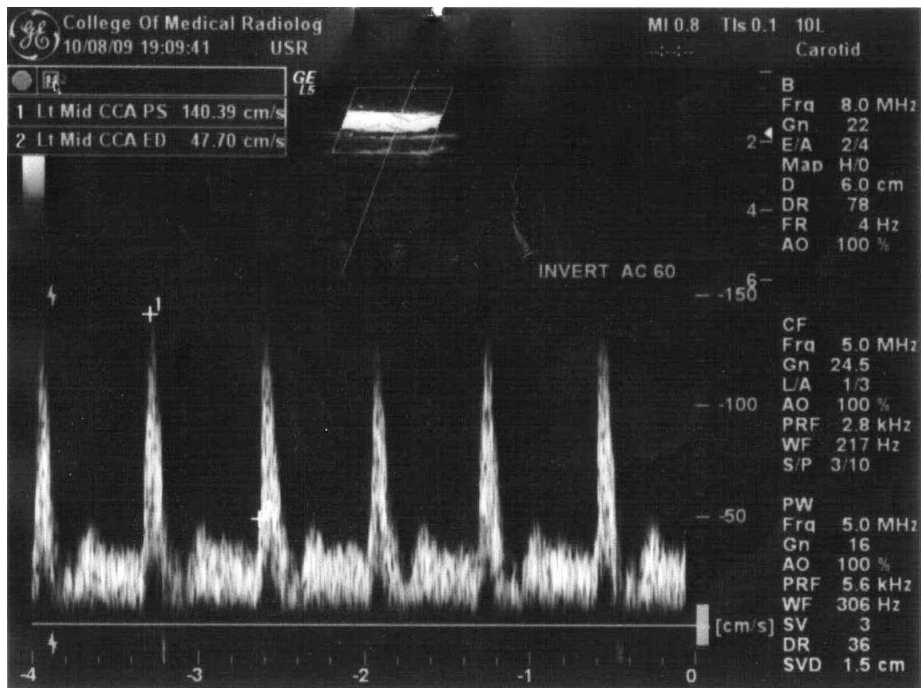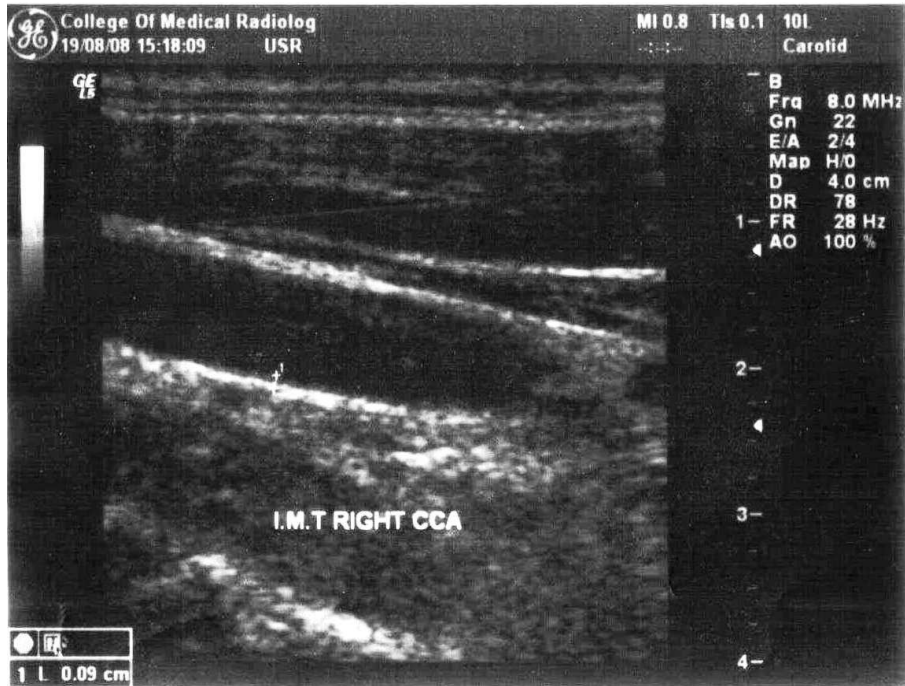
A.22 Rt CCA-Male-24 years-Current smoker (10 CPD) with IIMT-B-mode.
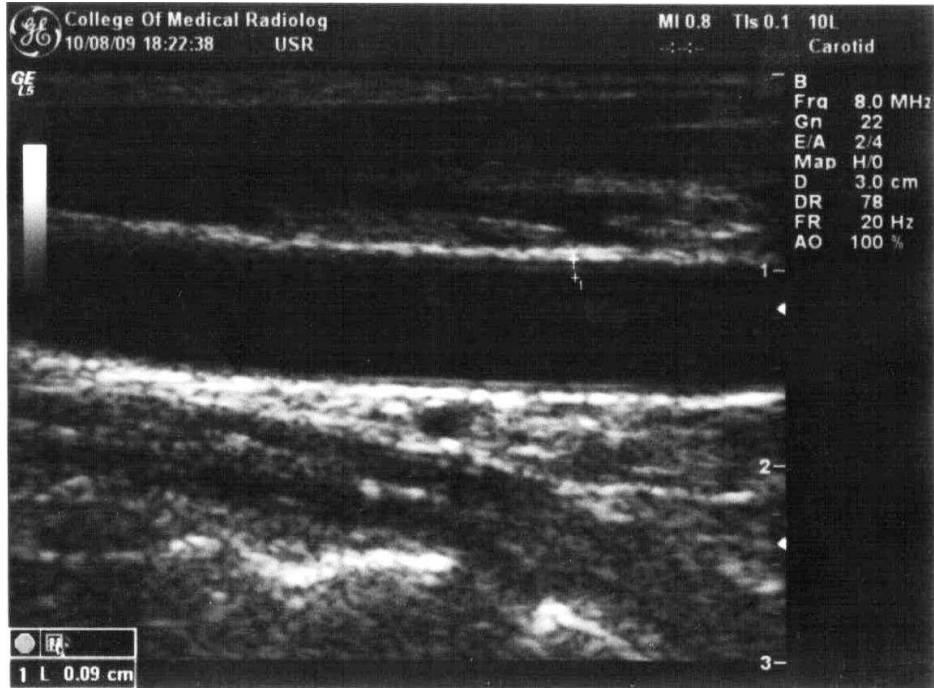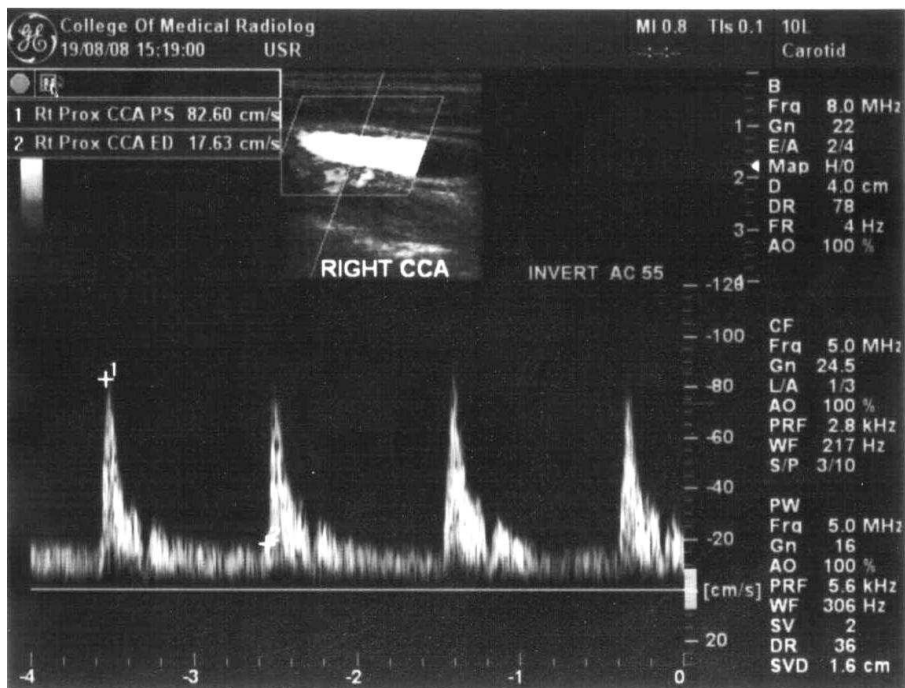

A.22 Rt CCA-Male-24 years- Current smoker (10 CPD) with IPSV and DEDV-Doppler Spectrum.
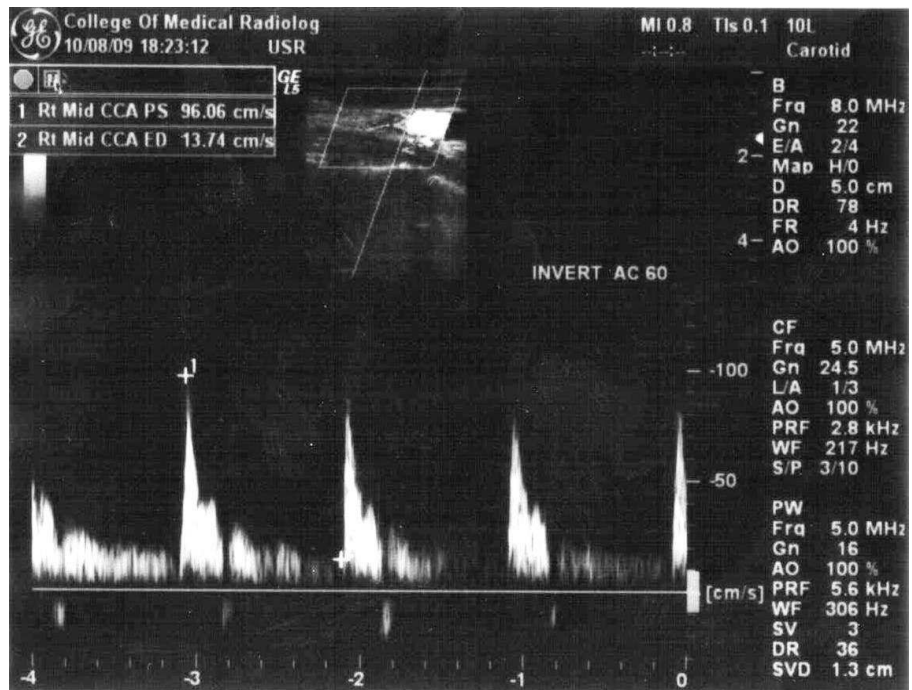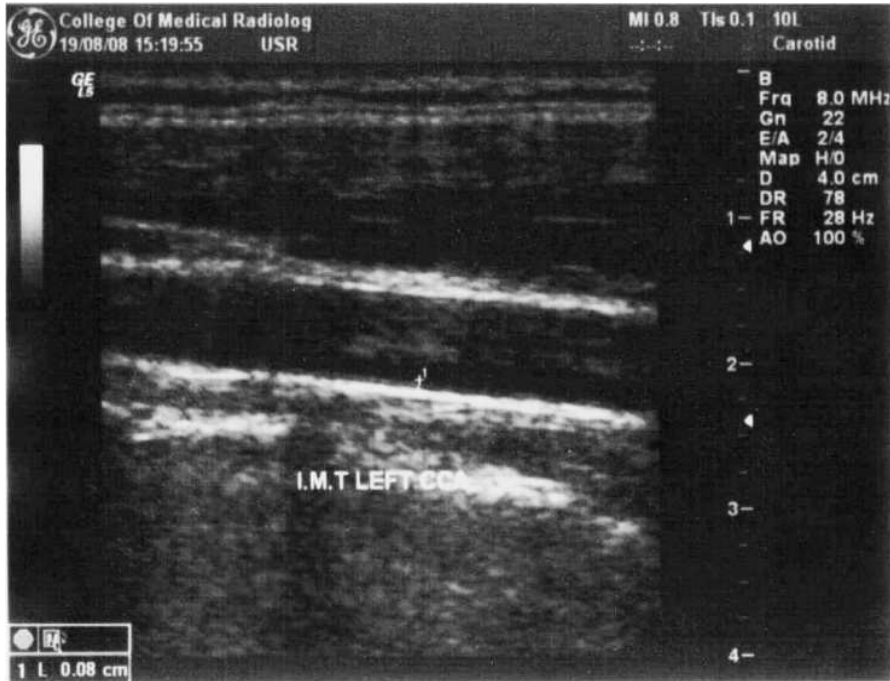
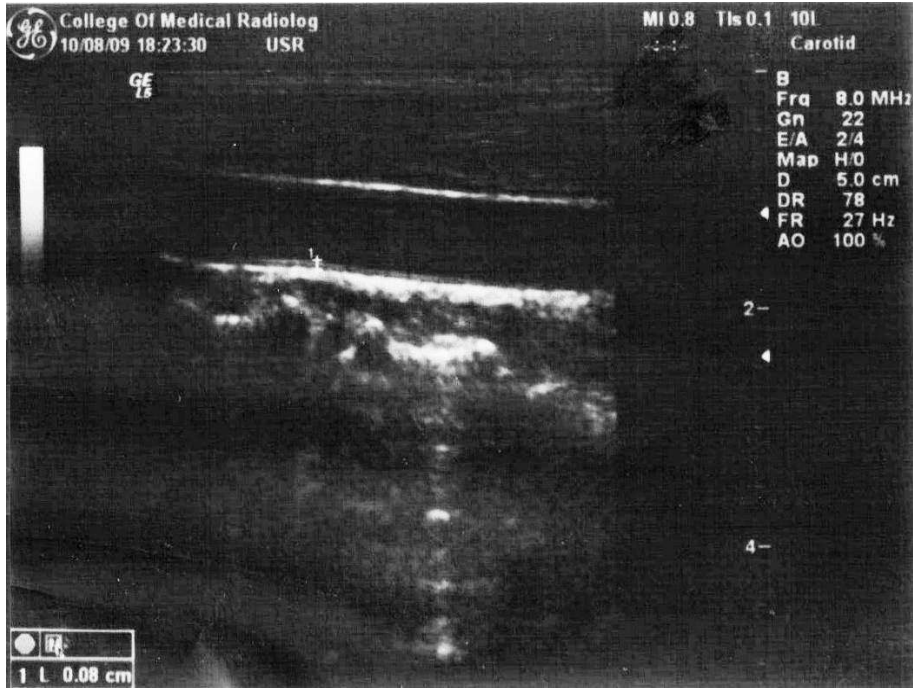**A.22 Lt CCA-Male-24 years-Current smoker (10 CPD) with IIMT-B-mode.**
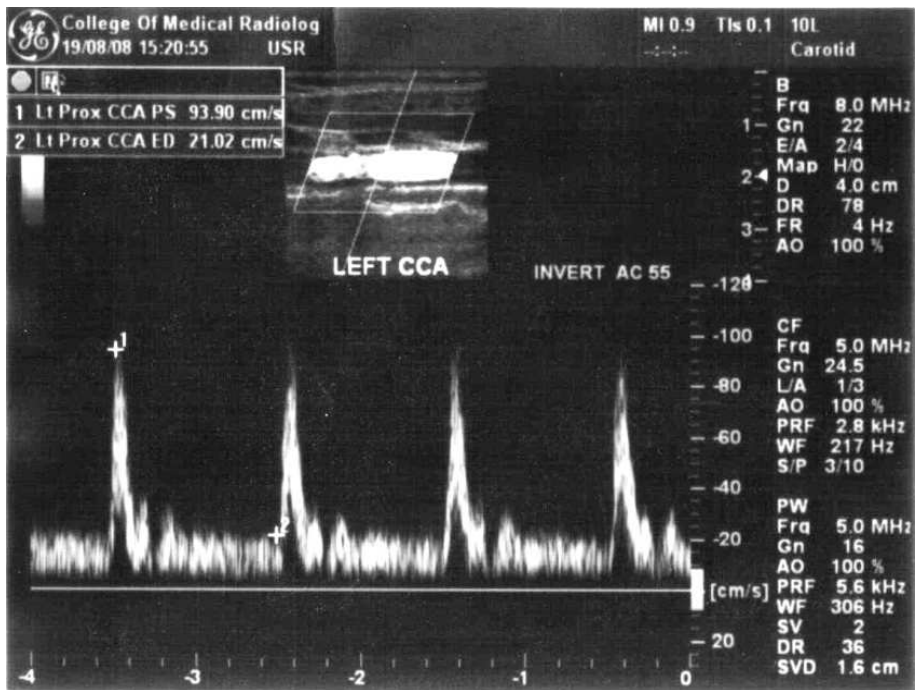
A.22 Lt CCA-Male-24 years- Current smoker (10 CPD) with IPSV and DEDV-Doppler Spectrum.
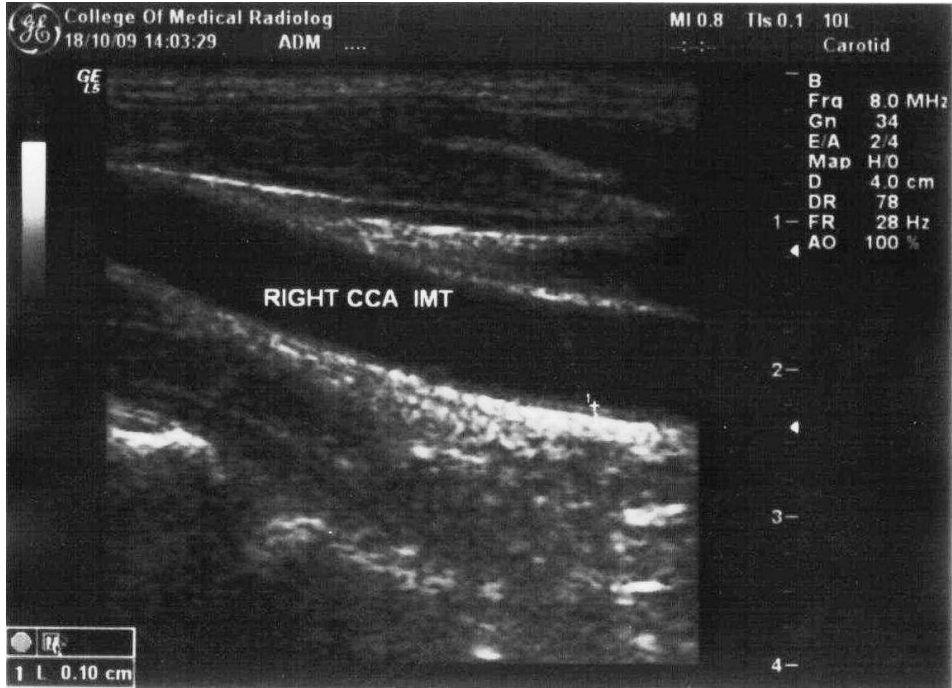
A.23 Rt CCA-Male-33 years-Former smoker (10 and more CPD) with IIMT-B-mode.
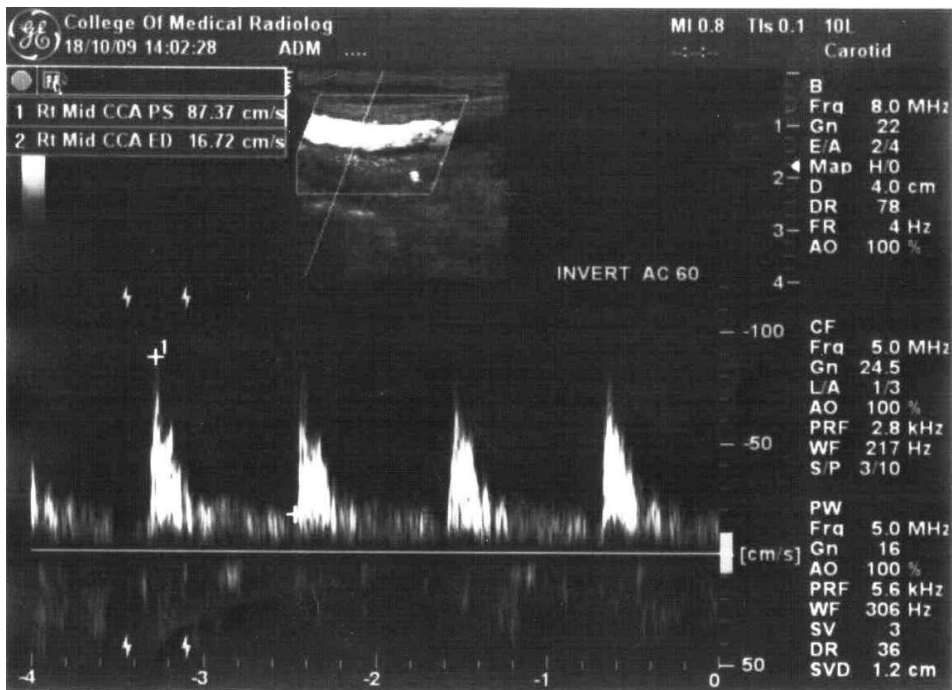
A.23 Rt CCA-Male-33 years- Former smoker (10 and more CPD) with IPSV and DEDV-Doppler Spectrum.
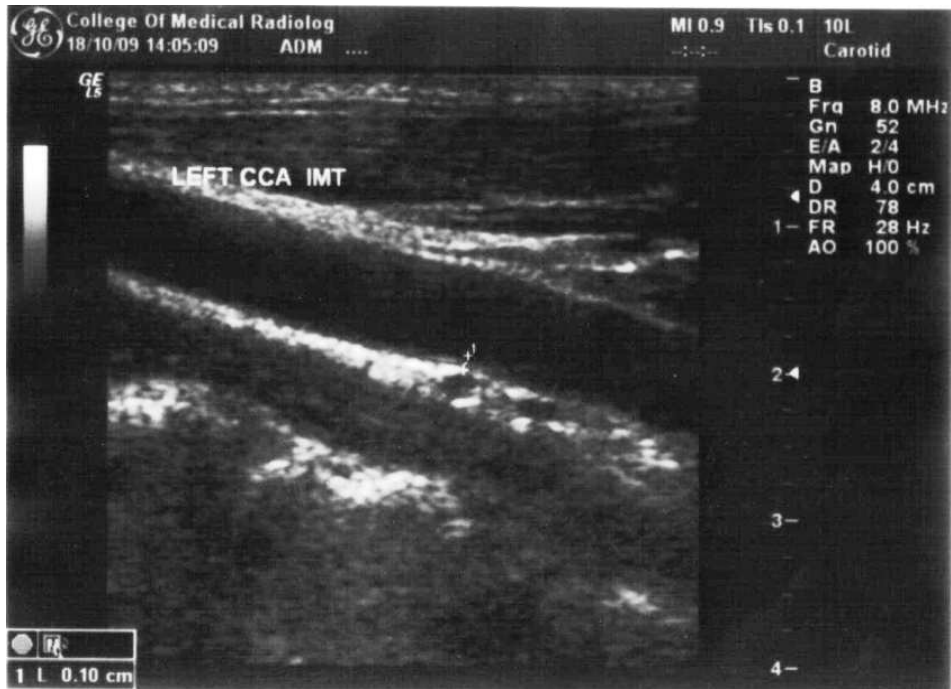
A.23 Lt CCA-Male-33 years-Former smoker (10 and more CPD) with IIMT-B-mode.
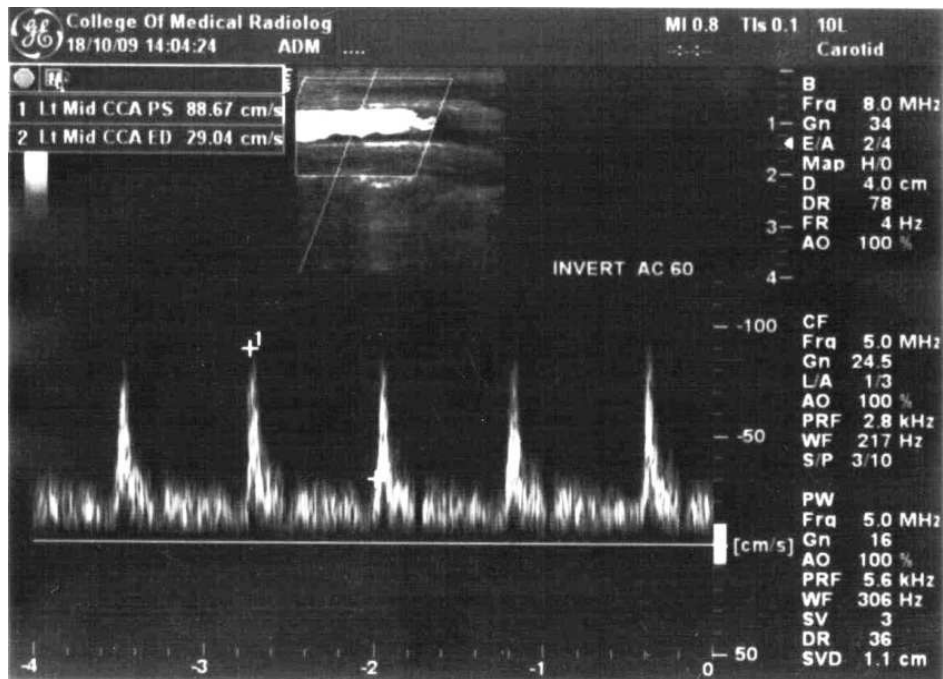
A.23 Lt CCA-Male-33 years- Former smoker (10 and more CPD) with IPSV and DEDV-Doppler Spectrum.
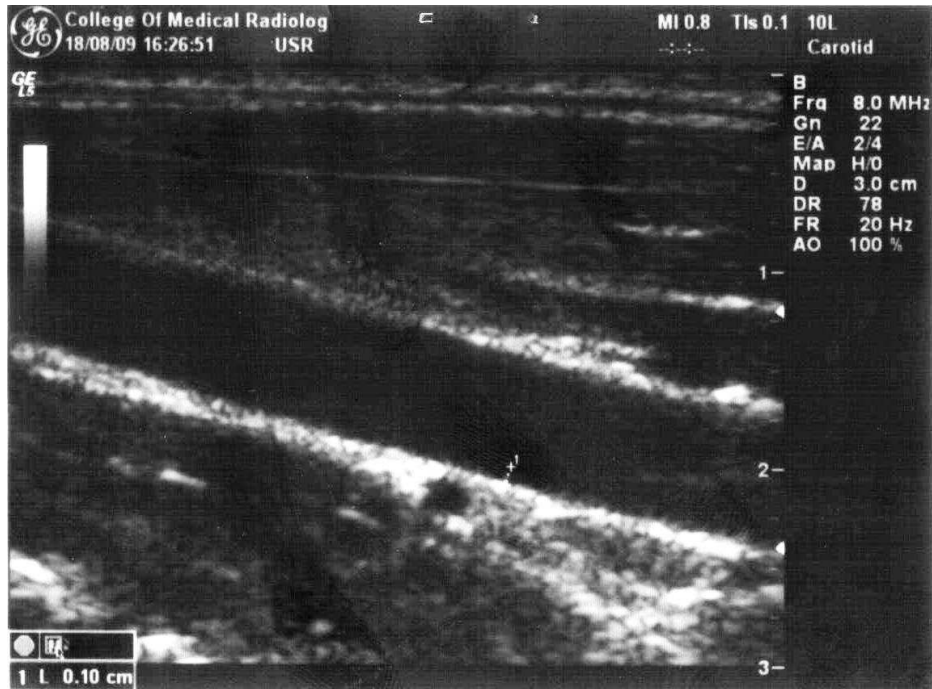
A.24 Rt CCA-Male-19 years-Recent smoker (10 CPD) with IIMT-B-mode.
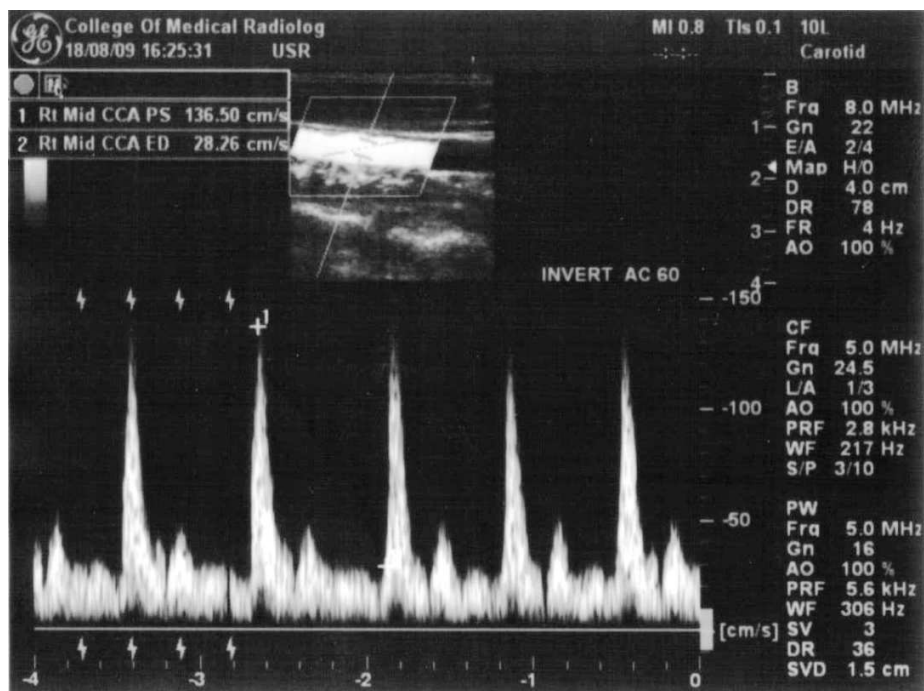
A.24 Rt CCA-Male-19 years- Current smoker (10 CPD) with IPSV and DEDV-Doppler Spectrum.
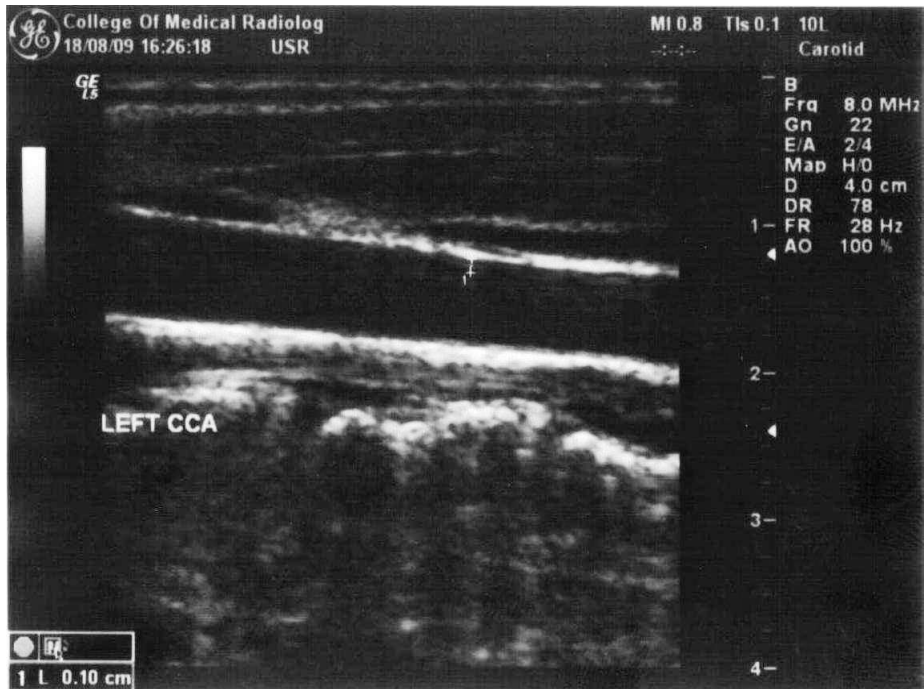
A.24 Lt CCA-Male-19 years-Recent smoker (10 CPD) with IIMT-B-mode.
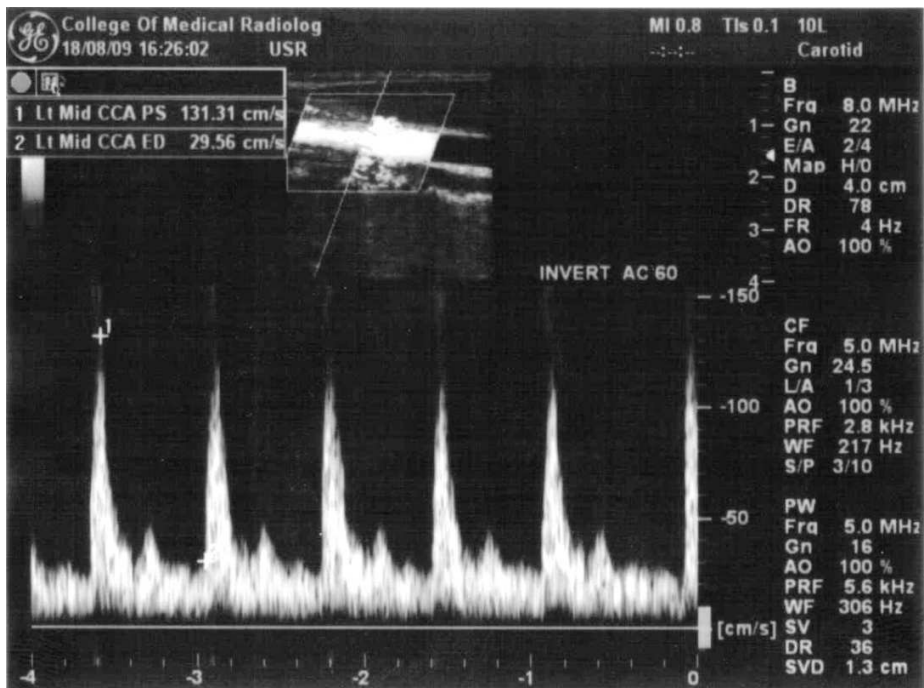
A.24 Lt CCA-Male-19 years- Current smoker (10 CPD) with IPSV and DEDV-Doppler Spectrum.
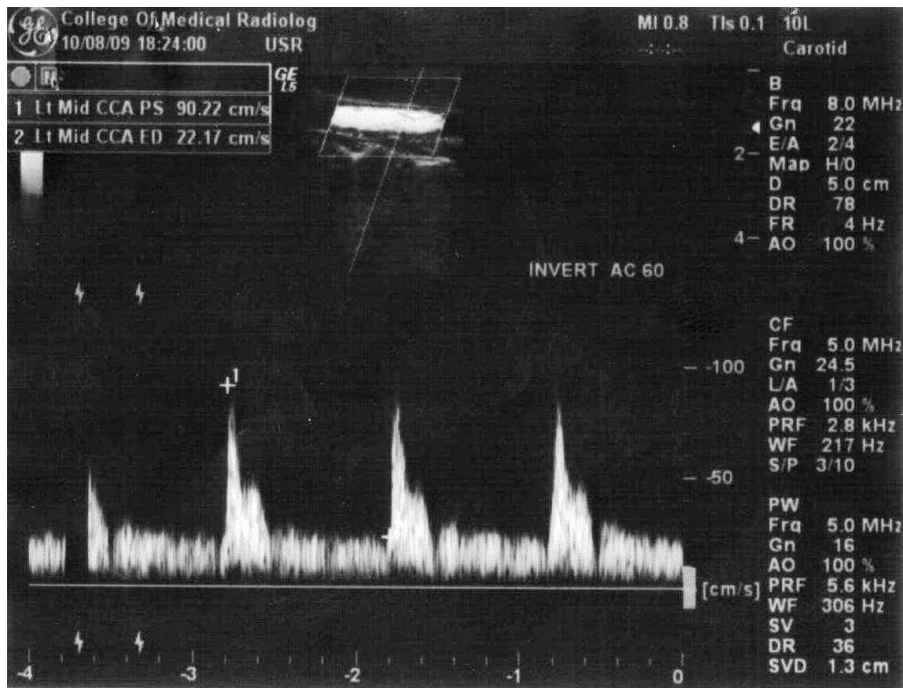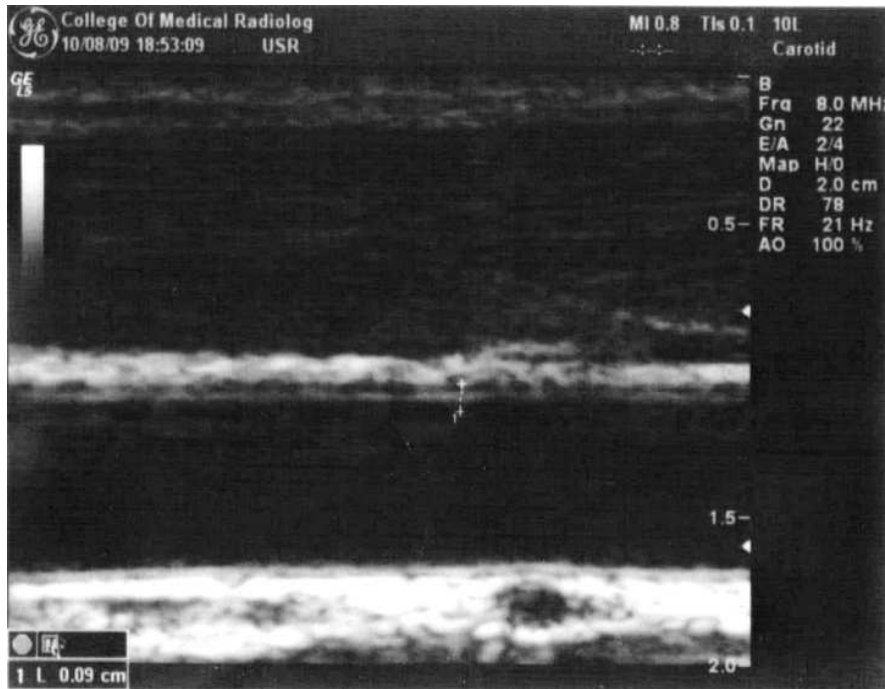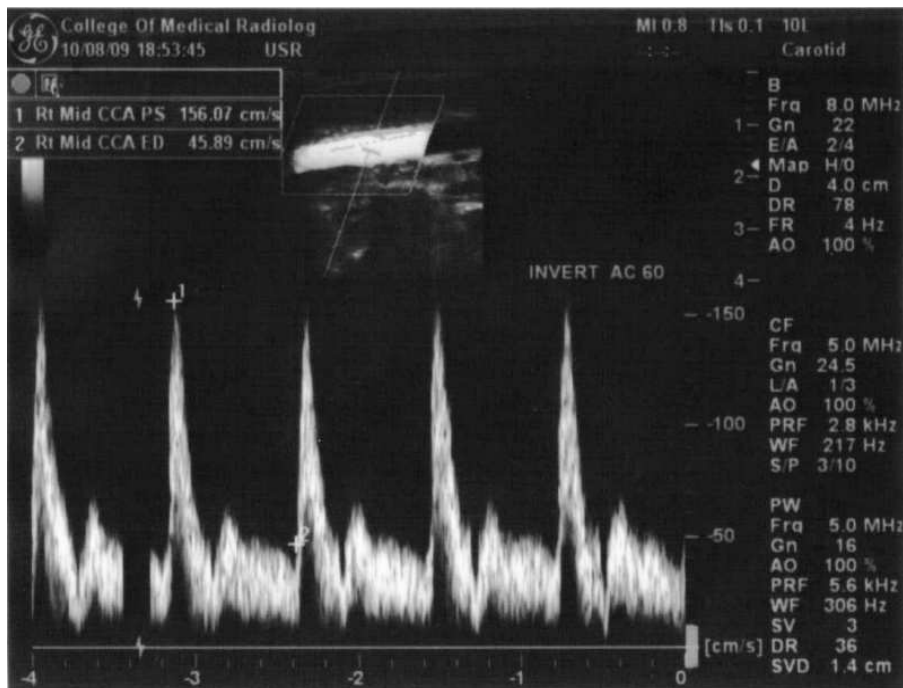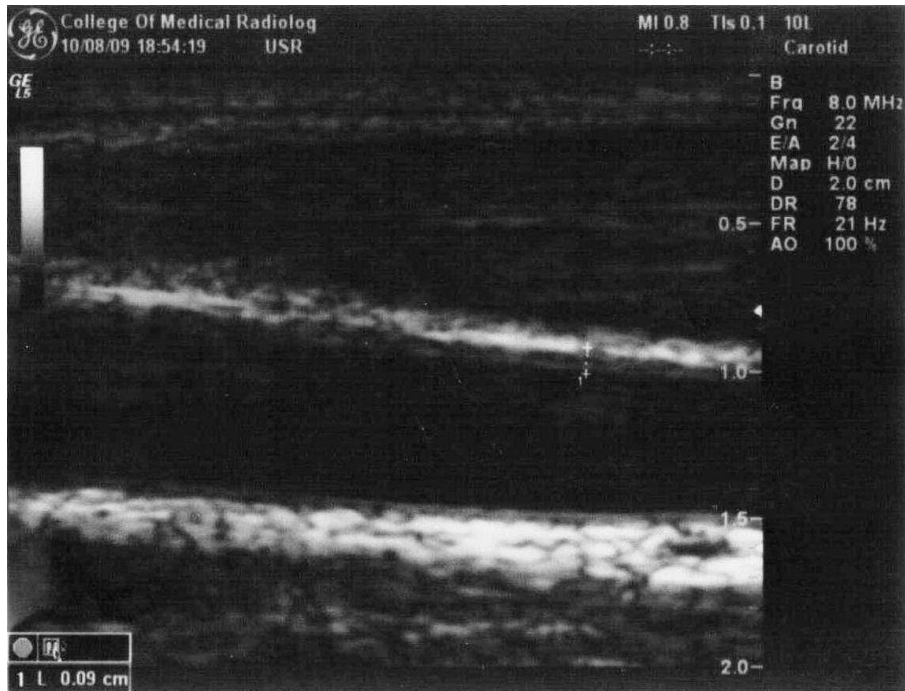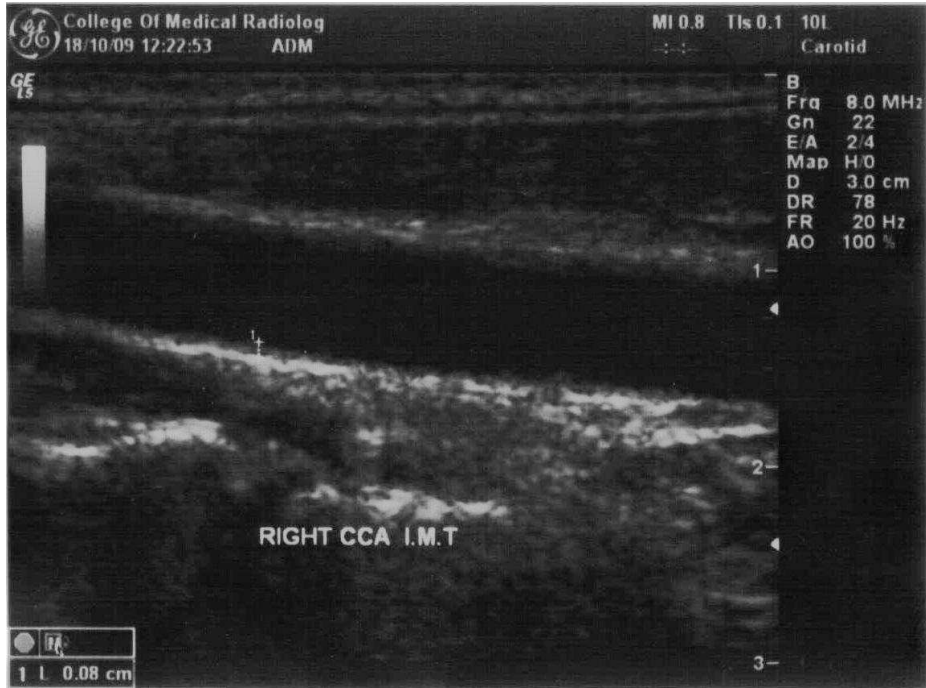
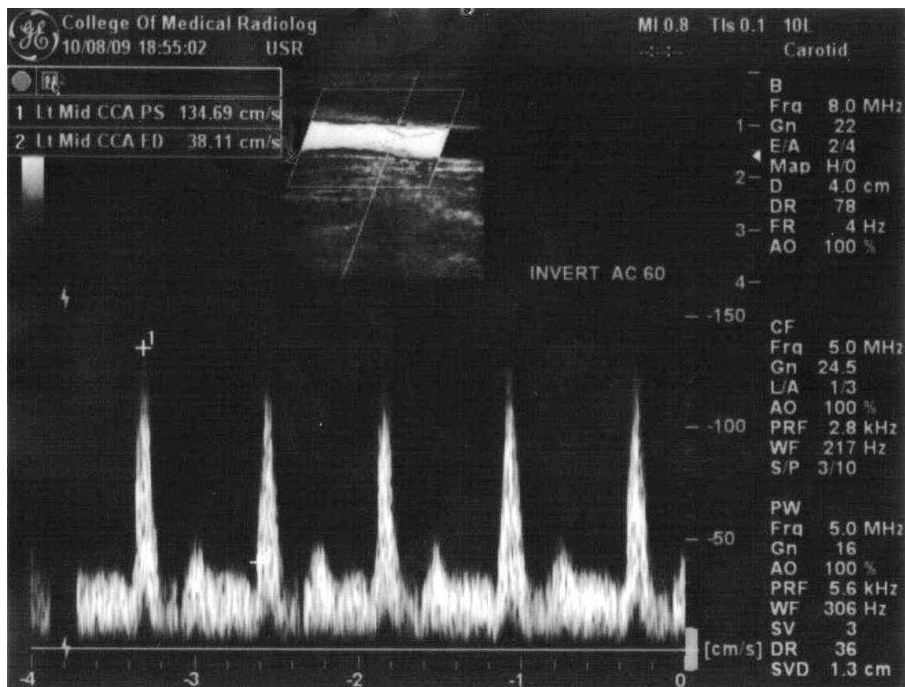**A.25 Rt CCA-Male-19 years-Former smoker (4 CPD) with IIMT-B-mode.**
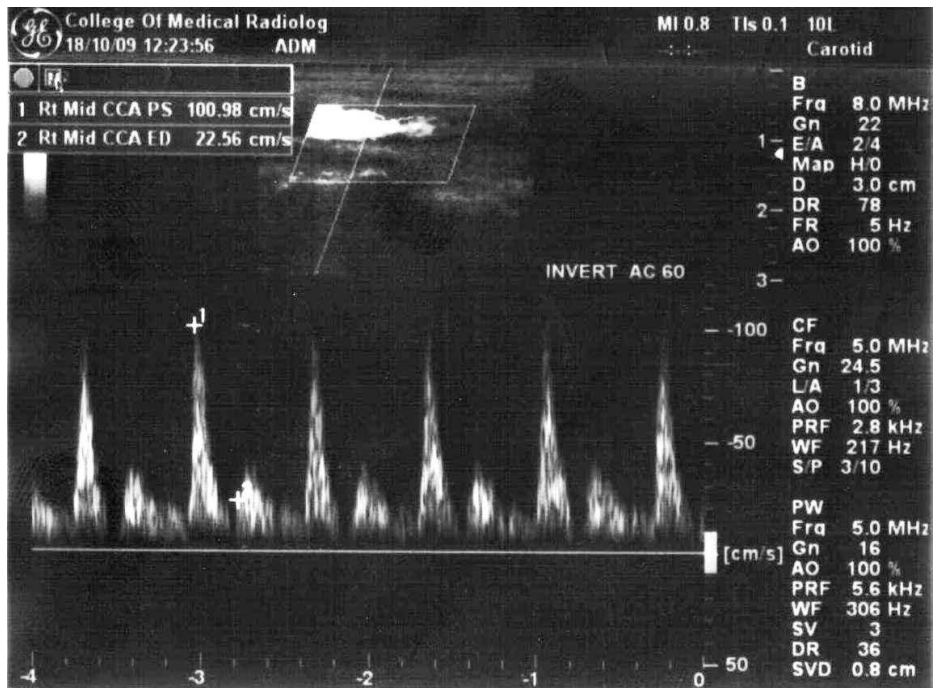
A.25 Rt CCA-Male-19 years- Former smoker (4 CPD) with IPSV and DEDV-Doppler Spectrum.
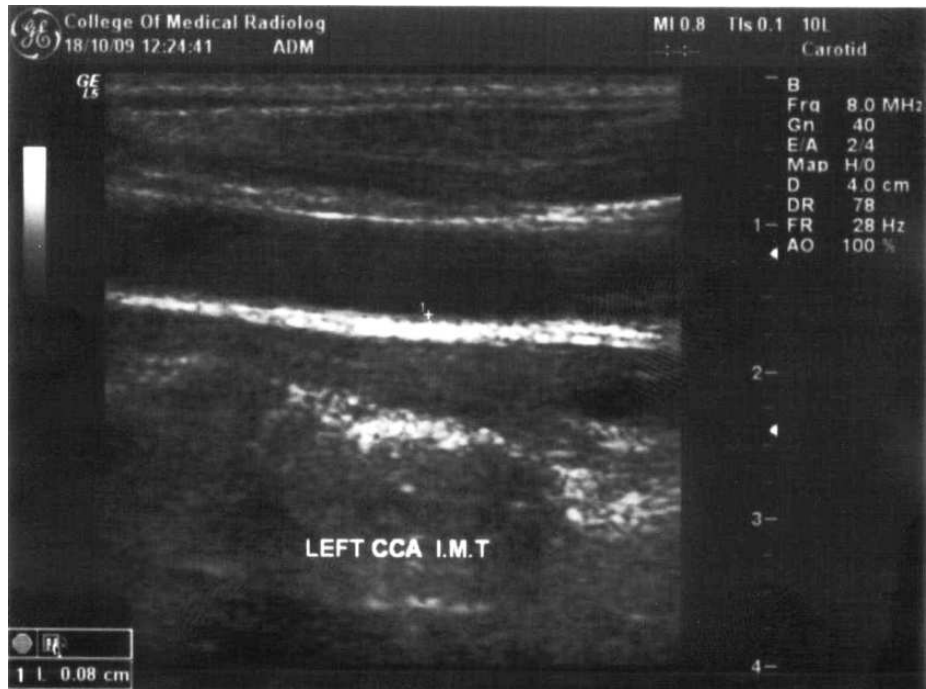
A.25 Lt CCA-Male-19 years-Former smoker (4 CPD) with IIMT-B-mode.
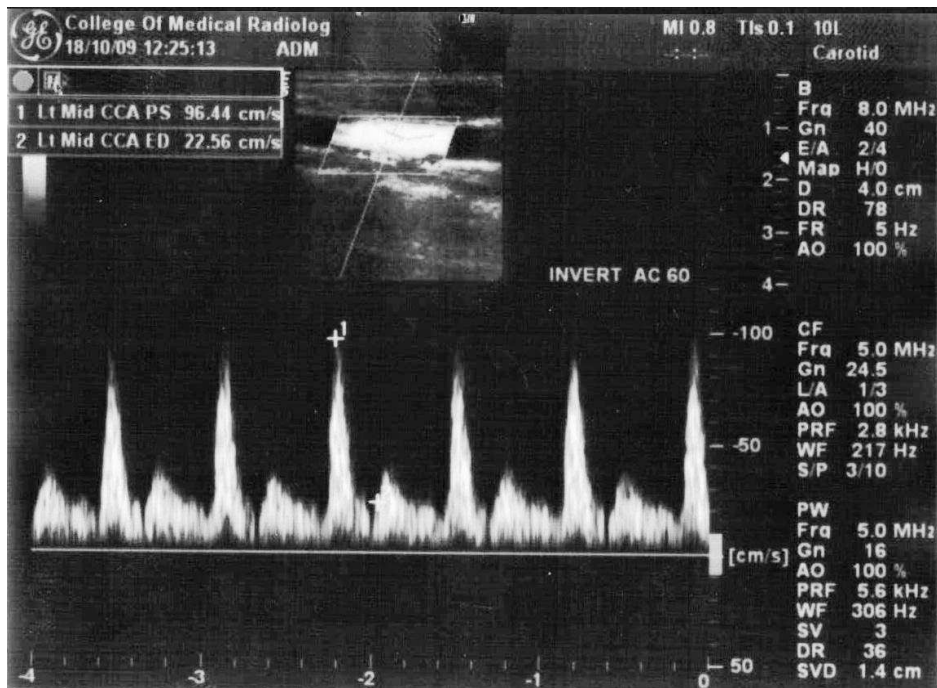
A.25 Lt CCA-Male-19 years- Former smoker (4 CPD) with IPSV and DEDV-Doppler Spectrum.

Appendix (B):

$$RI = \frac{PSV - EDV}{PSV} \tag{2.2}$$

$$PI = \frac{PSV - EDV}{mean} \tag{2.3}$$

From equation (3.2) & (3.3), the parameter PI could be deduced:

$$\frac{RI}{PI} = \frac{(PSV - EDV)}{(PSV)} \times \frac{(mean)}{(PSV - EDV)}$$

$$\frac{RI}{PI} = \frac{mean}{PSV}$$

$$PI = RI \frac{PSV}{mean}$$

$$\therefore \ PI \ \alpha \ PSV$$

Appendix (C):

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00008	192	.0801	.00981	.00071

One-Sample Test 1-4 CPD

	Test Value = 0.06					
				Mean	95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Difference	Lower	Upper
VAR00008	28.384	191	.000	.0201	.0187	.0215

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00009	96	.0900	.00995	.00102

One-Sample Test 5-9 CPD

	Test Value = 0.06					
				Mean	95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Difference	Lower	Upper
VAR00009	29.550	95	.000	.0300	.0280	.0320

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00010	160	.0997	.01003	.00079

One-Sample Test => 10 CPD

	Test Value = 0.06					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
VAR00010	50.139	159	.000	.0397	.0382	.0413

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00011	240	.0901	.01004	.00065

One-Sample Test 1-4 currentsmookers CPD

	Test Value = 0.06					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
VAR00011	46.479	239	.000	.0301	.0288	.0314

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00012	144	.0902	.01021	.00085

One-Sample Test 5-9 current smokers CPD

	Test Value = 0.06					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
VAR00012	35.520	143	.000	.0302	.0285	.0319

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00013	480	.0998	.01019	.00047

One-Sample Test => 10 current smokers CPD

	Test Value = 0.06					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
VAR00013	85.518	479	.000	.0398	.0389	.0407

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00008	192	.0801	.00981	.00071

One-Sample Test 1-4 CPD

	Test Value = 0.06					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
VAR00008	28.384	191	.000	.0201	.0187	.0215

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00009	96	.0900	.00995	.00102

One-Sample Test 5-9 CPD

	Test Value = 0.06					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
VAR00009	29.550	95	.000	.0300	.0280	.0320

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00010	160	.0997	.01003	.00079

One-Sample Test => 10 CPD

	Test Value = 0.06					
				Mean Difference	95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)		Lower	Upper
VAR00010	50.139	159	.000	.0397	.0382	.0413

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00011	240	.0901	.01004	.00065

One-Sample Test 1-4 currentsmookers CPD

	Test Value = 0.06					
				Mean Difference	95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)		Lower	Upper
VAR00011	46.479	239	.000	.0301	.0288	.0314

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00012	144	.0902	.01021	.00085

One-Sample Test 5-9 current smokers CPD

	Test Value = 0.06					
				Mean Difference	95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)		Lower	Upper
VAR00012	35.520	143	.000	.0302	.0285	.0319

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00013	480	.0998	.01019	.00047

One-Sample Test => 10 current smokers CPD

| | Test Value = 0.06 | | | | | |
| | | | | | 95% Confidence Interval of the Difference | |
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
VAR00013	85.518	479	.000	.0398	.0389	.0407

Appendices (D):

<u>Sudan University of Science and Technology</u>
<u>College of Graduated Studies</u>
<u>Doctorate of Philosophy in Medical Diagnostic Ultrasound</u>
<u>Data Collection Sheet (Questionnaire)</u>

Evaluation of Common Carotid Arteries in Sudanese Smokers Using Medical Diagnostic Ultrasound (B-mode and Doppler)

Date: ………………………….…   Ultrasound Centre: …………………………….

- **Patient Data:**
    - Patient ID: ……………………..
    - Patient Name: ……………………..
    - Gender: Male (   ) or Female (   ).
    - Age: ……………………..
    - Martial Status: Married (   ) or Single (   ).
    - Occupation: ……………………..
    - Location:
        A. North of Sudan   (   ).
        B. South of Sudan   (   ).
        C. West of Sudan   (   ).
        D. East of Sudan   (   ).
        E. Center of Sudan   (   ).

- **Smoking Status:**
    - Current smoker: yes (   ) or no (   ).
        - If yes, how many cigarettes smoked per day?
        1-4 cpd (   ) or 5-9 cpd (   ) or ≥ 10 cpd ( )

    - Former smoker: yes (   ) or no (   ).
        - If yes, how many cigarettes smoked per day?
        1-4 cpd (   ) or 5-9 cpd (   ) or ≥ 10 cpd ( )
    - Non smoker: yes (   ) or no (   ).

- **Ultrasound Findings:**

RT CCA	Value	LT CCA	Value
IMT (cm)		IMT (CM)	
PSV (cm/sec)		PSV (cm/sec)	
EDV (cm/sec)		EDV (cm/sec)	
RI		RI	
PI		PI	