A cohort study to find Incidence of Peripheral Arterial Disease in Thailand from EGAT study (I-PAD EGAT)

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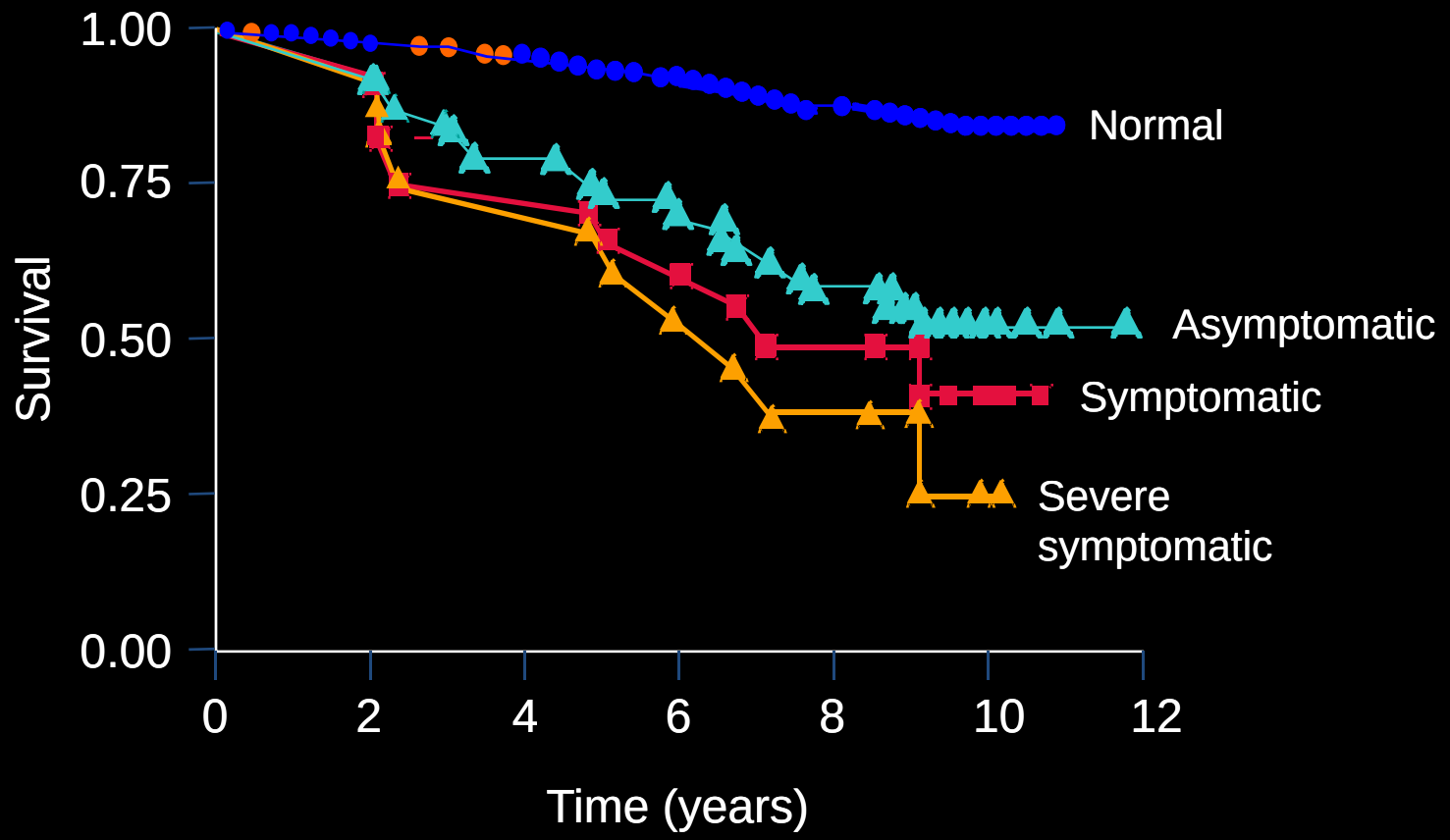
Background and Rationale

- Peripheral Arterial Disease (PAD) is one of burden diseases
- Systemic atherosclerosis
- Causes morbidity and mortality worldwide
- PAD is considered to be an established CAD equivalent.
- By year 2020, PAD will surely be one of the globally burden diseases.

Poor Outcomes of PAD

- Chronic Limb Ischemia(CLI)**:** is pain in lower extremity at rest or ulceration with or without tissue necrosis.
- Acute Limb Ischemia (ALI) : presents within hours with rest limb pain and a pulseless, painful foot. The vessel is occluded with a thrombus on top of mild to severe lesions.ALI is a result from plaque rupture followed by in situ thrombosis or migration of a clot from proximal location.

PAD mortality : 10-year survival rates the San Diego Artery Study



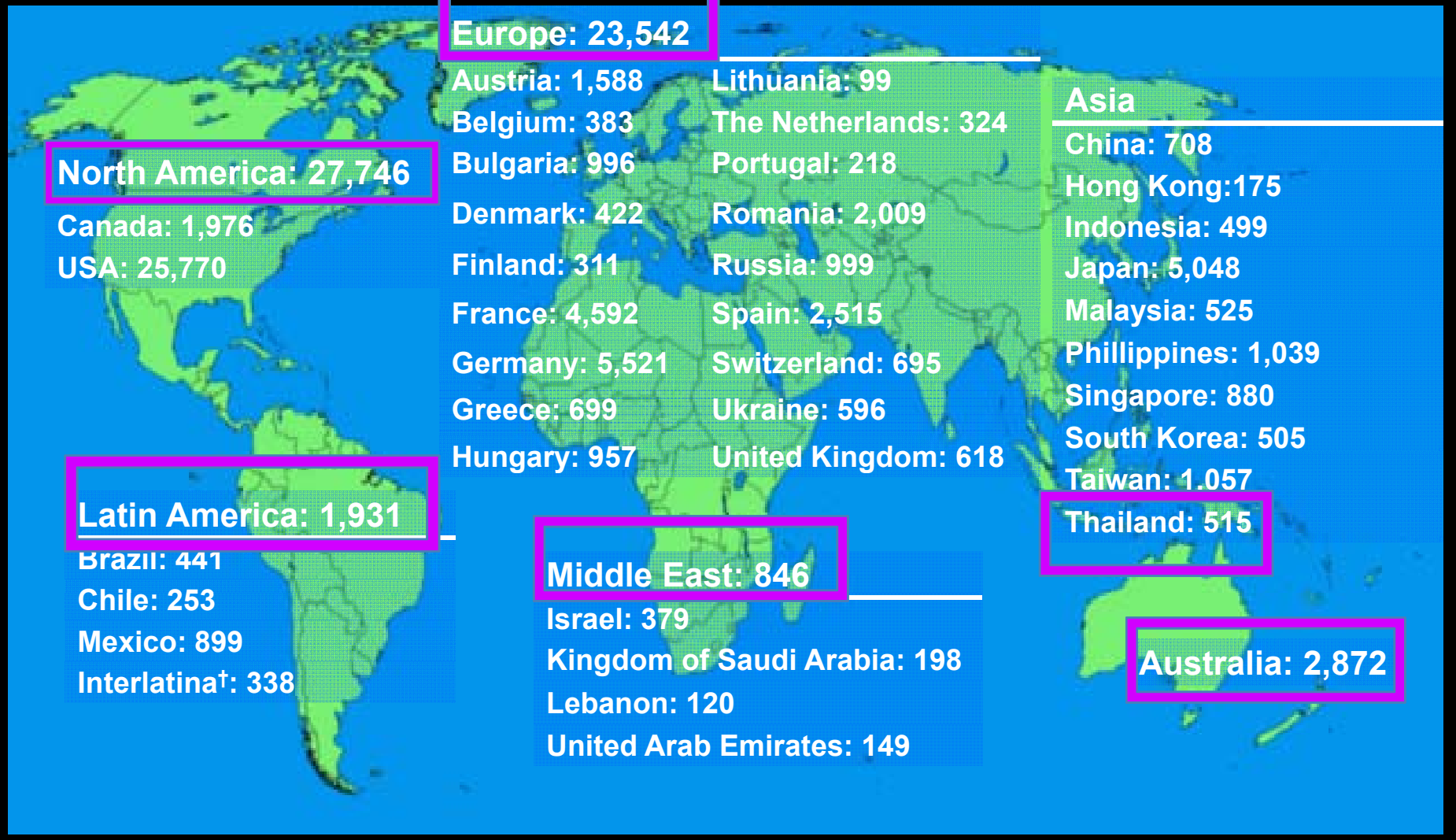
Criqui MH *et al*. *N Engl J Med* 1992;326:381–386.

- In USA, the incidence of symptomatic Peripheral Vascular Disease(PVD) increases with age

-from about 0.3% per year for men aged 40–55 years to about 1% per year for men aged over 75 years.

- In Thailand, the study data on PAD is still scant, even we had been enrolled in the REACH registry trial.

REACH Study(n= 68,236)



PAD burden internationally

- REACH STUDY
- Reduction of Atherothrombosis for Continued Health (REACH) Registry
- 68,236 patients with either known atherosclerotic arterial disease (n= 55,814) or at least had 3 risk factors for atherothrombosis (n=12,422)
- from 5,587 practices in 44 countries in December 2003- June2004.

AmHeart J. 2006;151: 786.e1-786.e10.

PAD Prevalence

- 18.3% in UK
- 19.1% in Netherlands
- 18% in Germany and Sweden, ranging from 3.7-16.6% in US from different studies
- 19.8% in China
- 11.7% in Saudi Arabic
- 10.5% in Spain
- 29.3% in South Africa
- 3.2% South India
- 5.2% in Thailand

Review: Ethnicity and peripheral artery disease ,Q J Med 2009; 102:3–16

Sritara, P. International Epidemiology Journal, 2003.

REACH Study

- Demonstrated that PAD patients had high prevalence of underlying vascular disease, multiple atherothrombotic risk factors.
- Found that there was underutilization in treating cardiovascular risk

- PAD prevalence in Thailand 5.2% *

* Sritara, P. International Epidemiology Journal, 2003.

EGAT 2002

- In Thailand, from EGAT employee
- Overall prevalence of PAD was 5.2% ,with finding of 4% in male and 9% in female.
- Hypertension, women, current smoking, current alcohol drinking and overweight have been found to be significant predictors of PAD

* Sritara, P. International Epidemiology Journal, 2003.

- **Incidence of PAD from EGAT populations**

I-PAD EGAT

- Inclusion Criteria: All of the Employee from previous EGAT study population in 2002

I-PAD EGAT

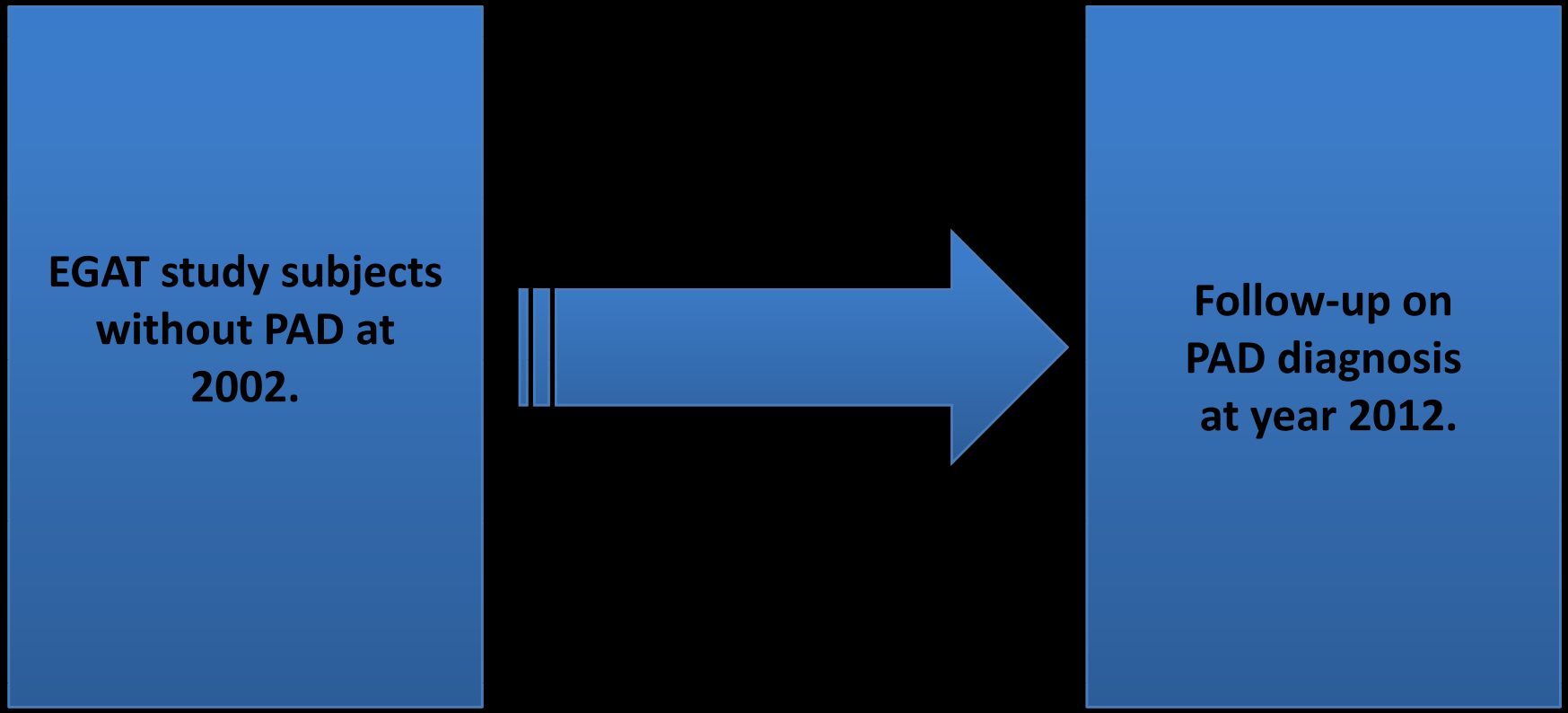
- Exclusion: Loss of contact and not followed up in this study

Objectives

- **Primary objective**
  - To find PAD incidence from EGAT study
- **Secondary objectives**
  - To estimate prevalence of PAD from EGAT
  - To assess influence of RFs on new PAD development
  - To find mean CAVI value (indicate arterial stiffness)

Methodology

- Cohort study



Populations

Population

Elderly age 50-74, middle-class, urban

Study sample

All EGAT employee who are available in former and this EGAT study.

Definition

- Peripheral artery disease (PAD)
- Year 10^{th} PAD
- Cumulative 10 years PAD

Operational Definitions

PAD	Lowest resting ABI<0.9
Asymptomatic PAD	PAD + no leg symptom
IC[i]	
-Typical	Calf pain while walking Disappears in 10 min after standing still Never occurs at rest
-Atypical	Exertional leg pain other than calf

[i]Rose GA. Bull WHO 1962;27:645-58.

Operational Definitions

Diabetes[i]	FBG≥126 mg/dl or on hypoglycemic Rx
Hypercholesterolaemia[ii]	TC≥240 mg/dl or on lipid-lowering Rx
Hypertension[iii]	Systolic BP ≥ 140 mmHg or diastolic BP ≥ 90 mmHg or on antihypertensive Rx

[i]ADA. Diabetes Care 2000;23(Suppl 1):s20-3

[ii]NCEP III. JAMA 2001;285:2486-97

[iii]1999 WHO/ISH. J Hypertens 2001;19(12):2285-8

Operational Definitions

Thais	Individuals who had lived in Thailand for ≥17 yrs
Current smoker	Individuals who currently smoke ≥1 cigarette per day for at least 1 yr
Current alcohol drinker	Individuals who currently take ≥1 drink of alcohol beverage at least once a month for at least 1 yr

I-PAD EGAT

- **Diagnosis of Peripheral Arterial Disease:**

  ABI <0.9 is made for the diagnosis of PAD in this study.

- normal ABI (1.11-1.40)

ABI

ADA & AHA

5 min rest, quiet and supine

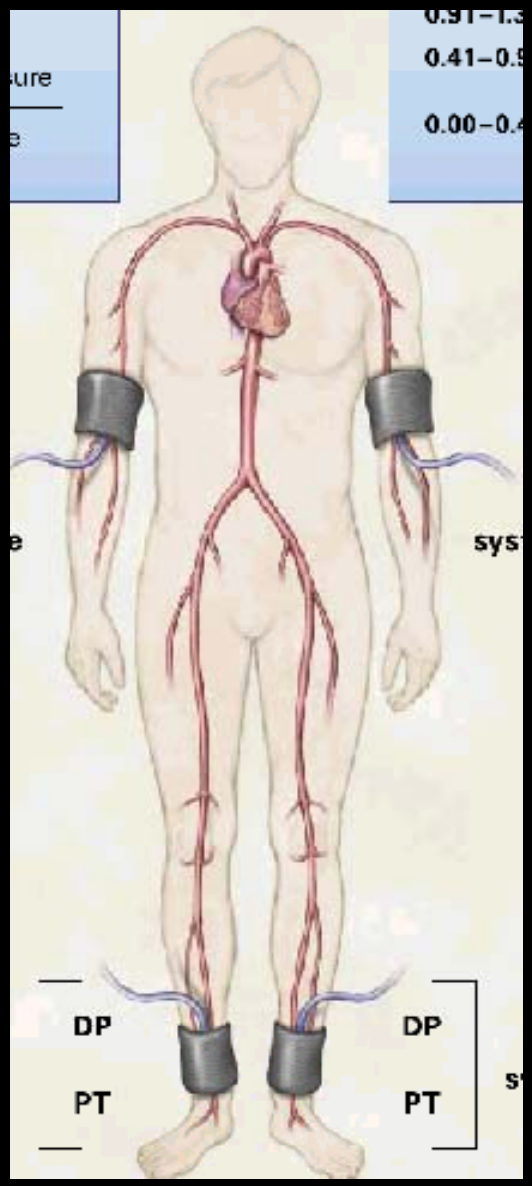
Angle probe 60 degrees

Move probe back & forth

Inflate≥20 mmHg

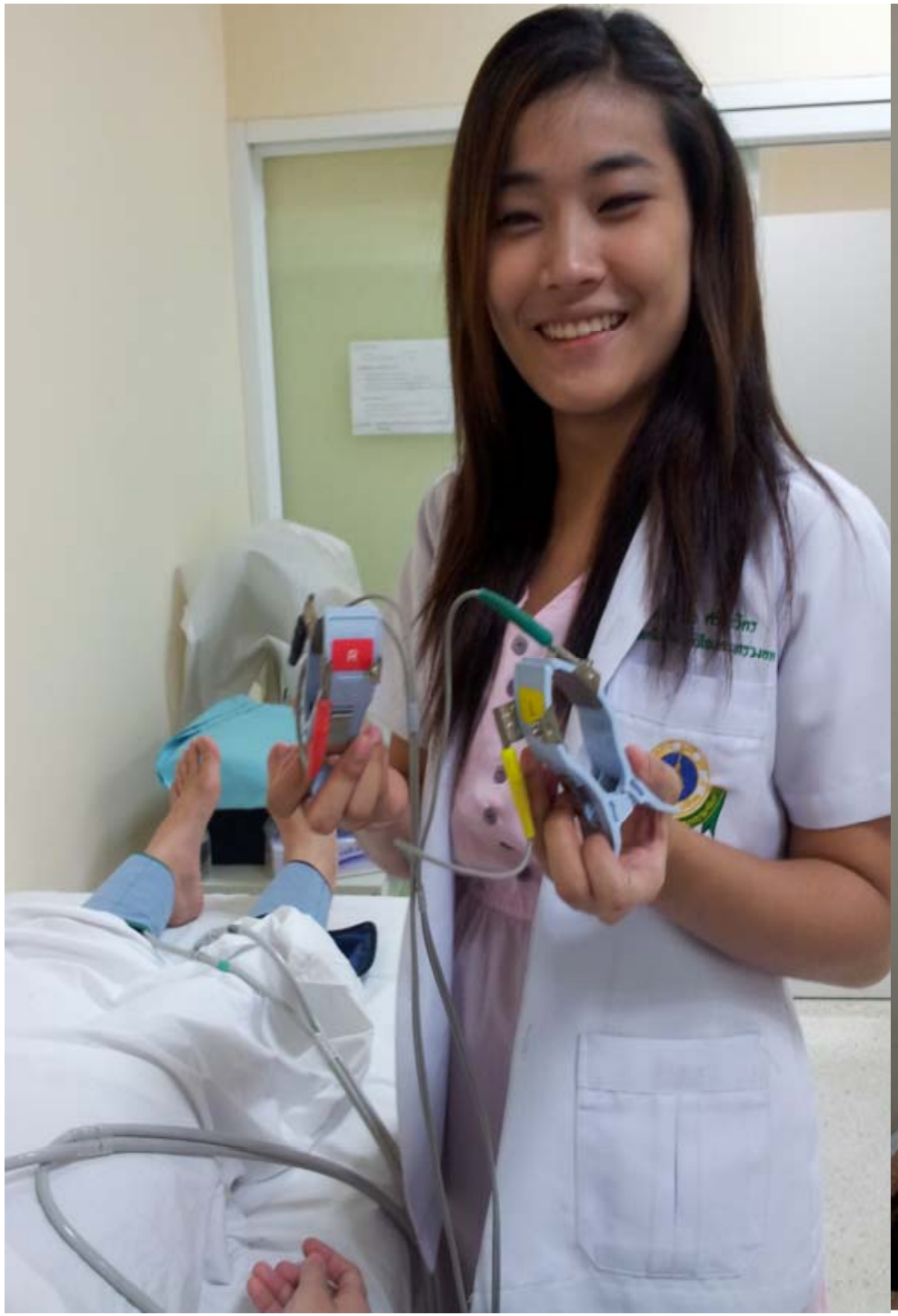
Slow deflation: 2mmHg/sec

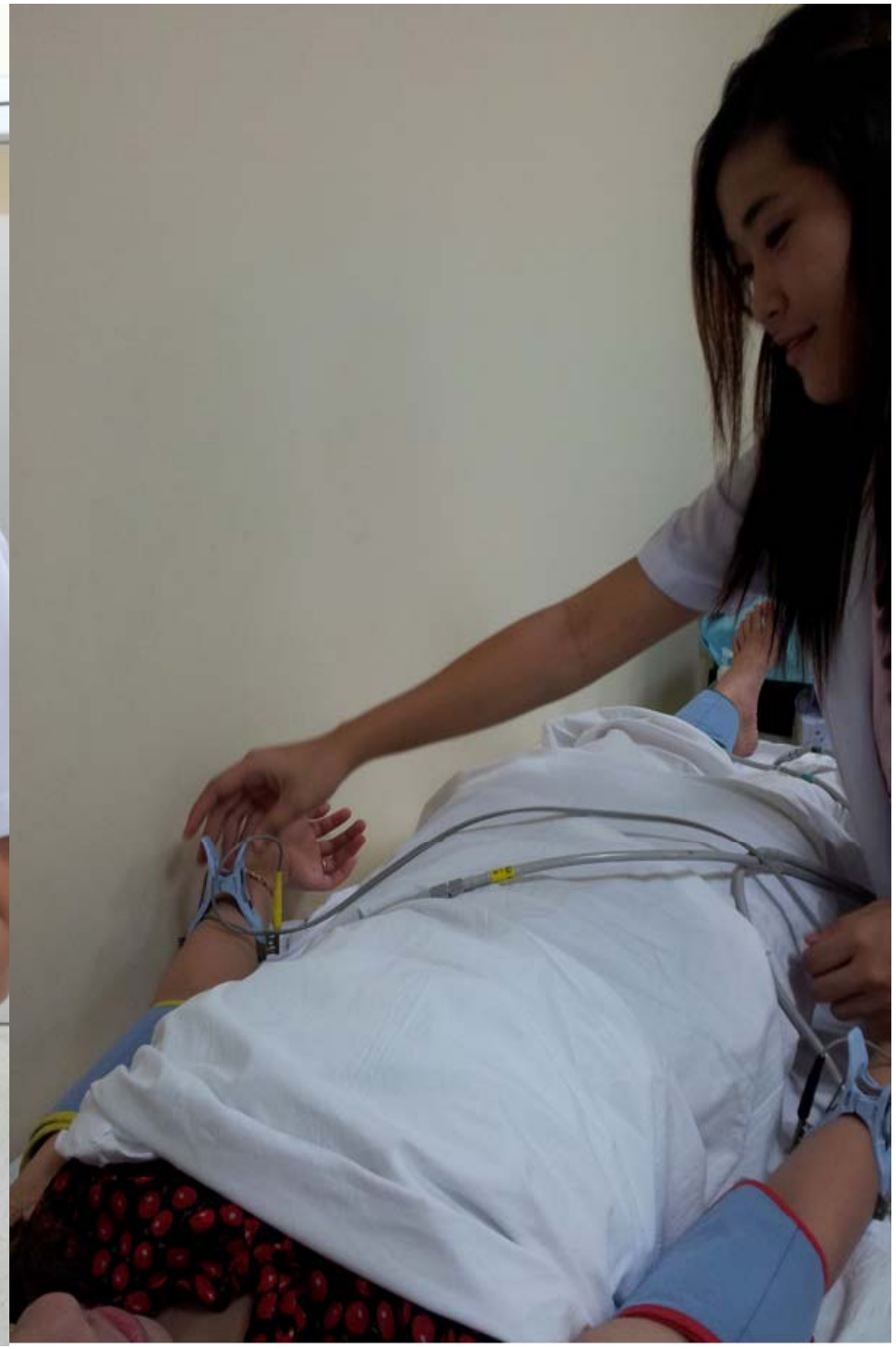
Syst BP: 1st signal during deflation

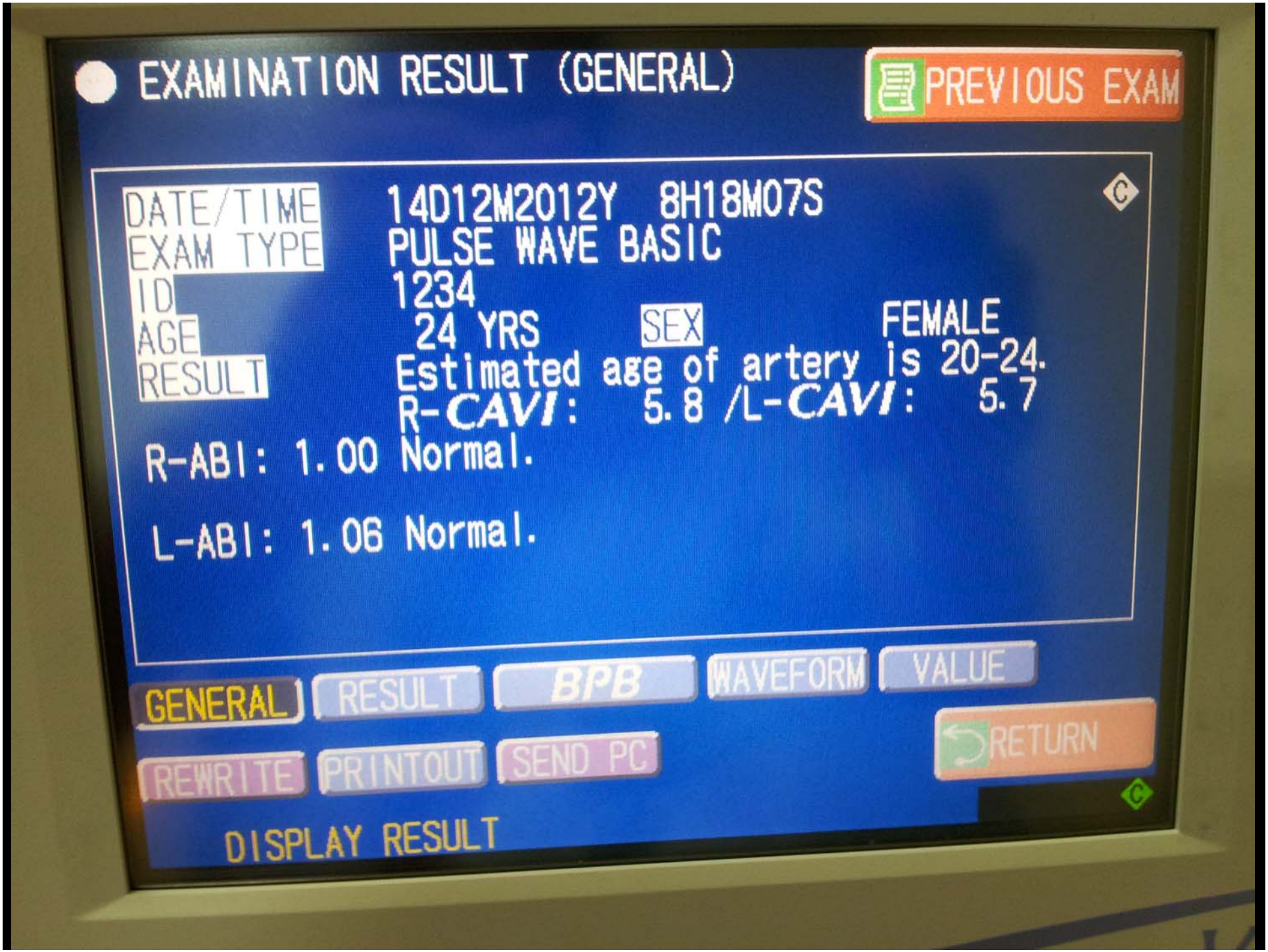


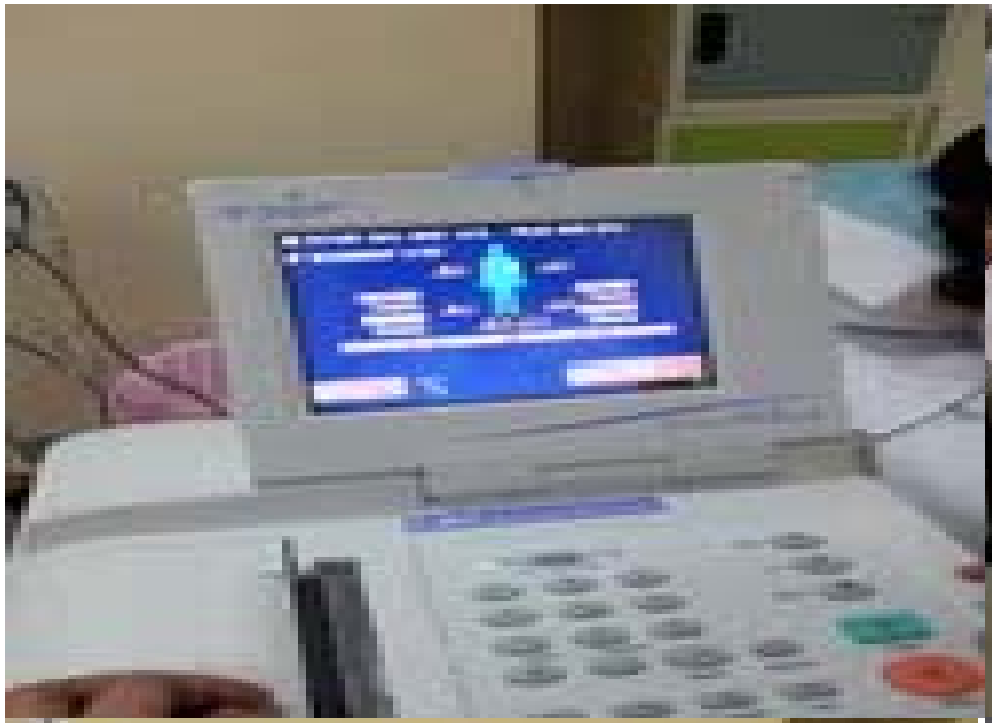
Pocket Doppler
MINIDOP ES100VX

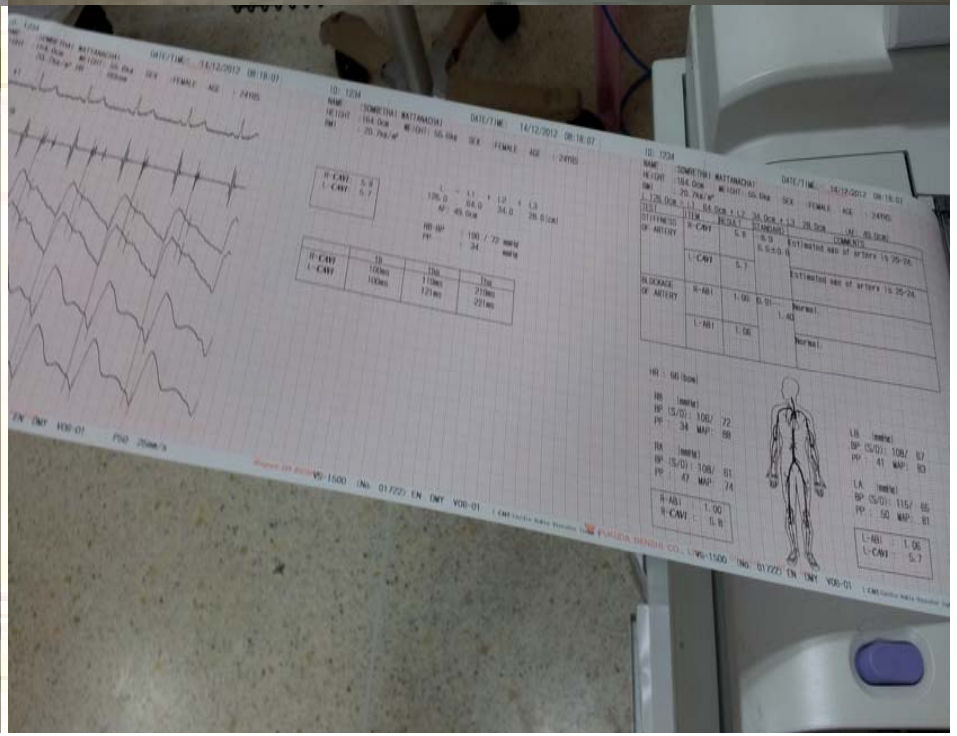
ADA & AHA. Circulation 1993;88(2):819-28

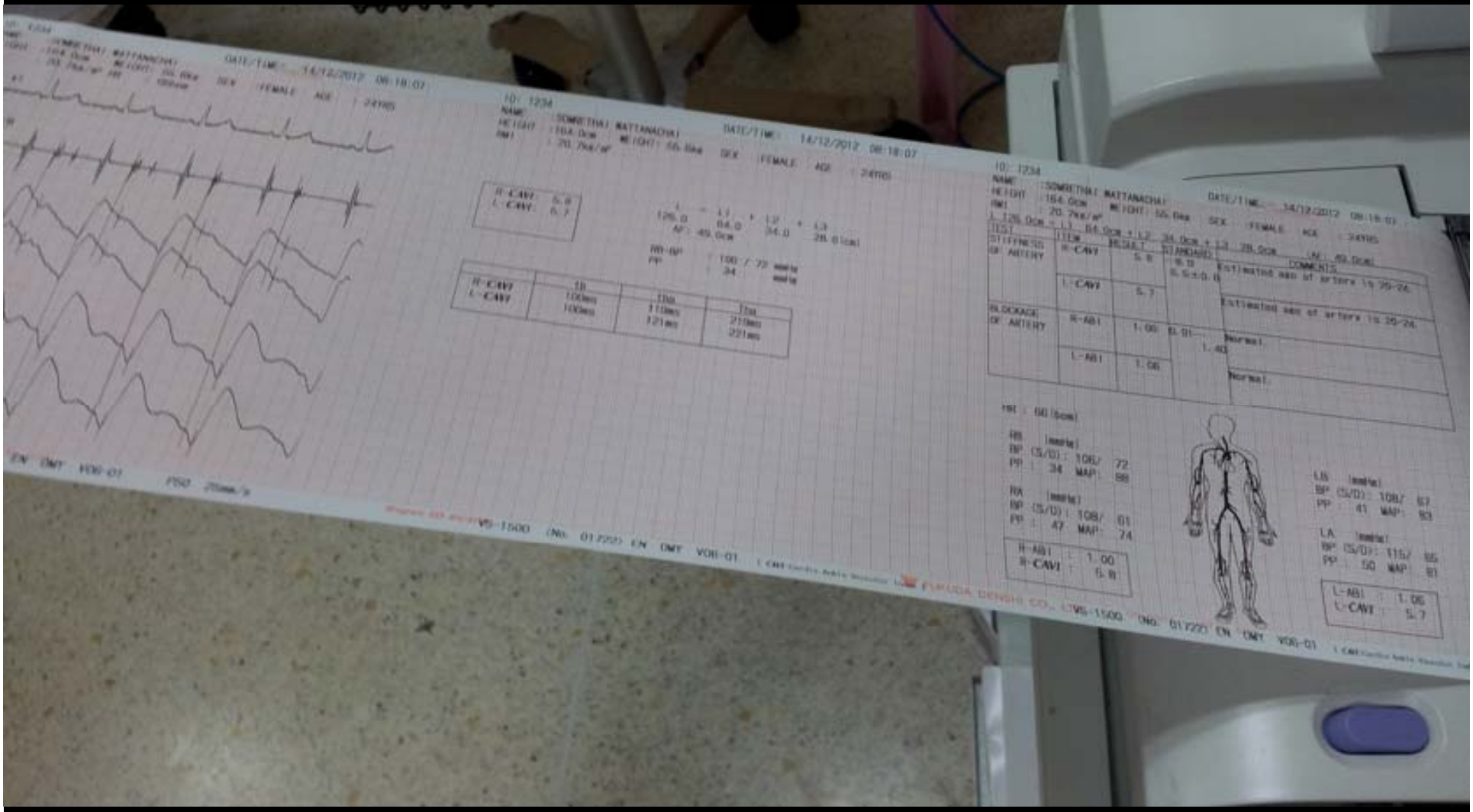





EXAMINATION RESULT (GENERAL)
PREVIOUS EXAM
DATE/TIME 14D12M2012Y 8H18M07S
EXAM TYPE PULSE WAVE BASIC
ID 1234
AGE 24 YRS SEX FEMALE
RESULT Estimated age of artery is 20-24.
R-CAVI: 5.8 /L-CAVI: 5.7
R-ABI: 1.00 Normal.
L-ABI: 1.06 Normal.
GENERAL
RESULT
BPB
WAVEFORM
VALUE
RETURN
REWRITE
PRINTOUT
SEND PC
DISPLAY RESULT






ID: 1234
NAME: SOMRETHAI MATTANACHAI
DATE/TIME: 14/12/2012 08:18:07
HEIGHT: 164.0cm
WEIGHT: 55.0kg
BMI: 20.7kg/m²
SEX: FEMALE
AGE: 24YRS
R-CAVI 5.8
L-CAVI 5.7
R-ABI 1.00
L-ABI 1.06
BP (S/D): 108/ 72
PP: 34 MAP: 88
BP (S/D): 108/ 61
PP: 47 MAP: 74
BP (S/D): 108/ 67
PP: 41 MAP: 93
BP (S/D): 115/ 85
PP: 30 MAP: 81
VS-1500 (No. 01722) EN OMT VOR-01
FUKUDA DENSHI CO., LTD.

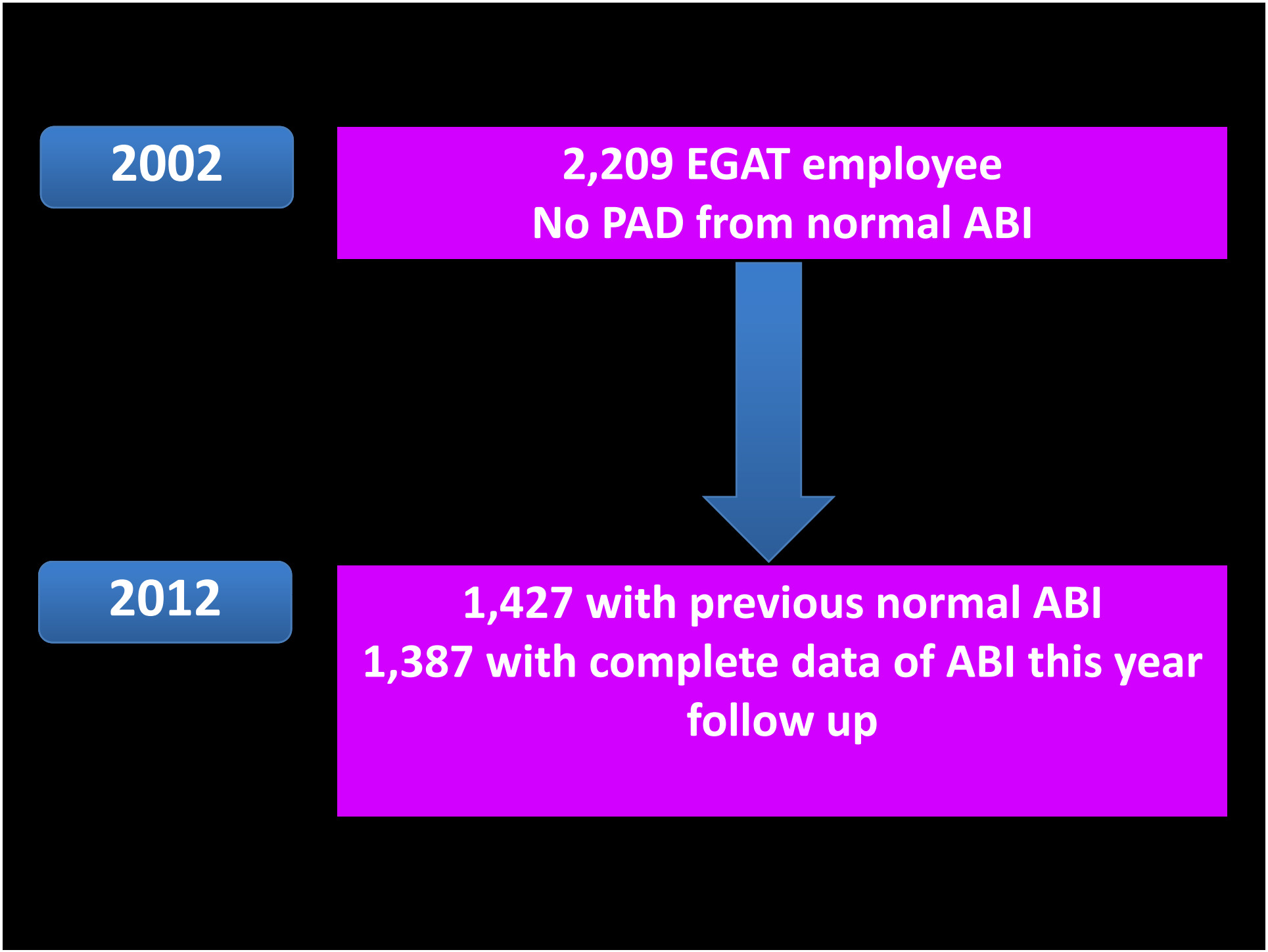
Statistical Methods

- Descriptive statistic (mean, SD, percent) for subject characteristics explanation and incidence analysis.
- KS-test for normal distribution test.
- Z-test to demonstrate mean of ABI and CAVI.
- Paired T-test to test difference b/w ABI_{2002} and ABI_{2012}, ABI and CAVI at 2012
- Univariate and multivariate logistic regression for demonstrating the predictor of peripheral artery disease (PAD) in elderly.

Statistical Methods

- Univariate and multivariate logistic regression for demonstrating the predictor of peripheral artery disease (PAD) in elderly.

Study Results

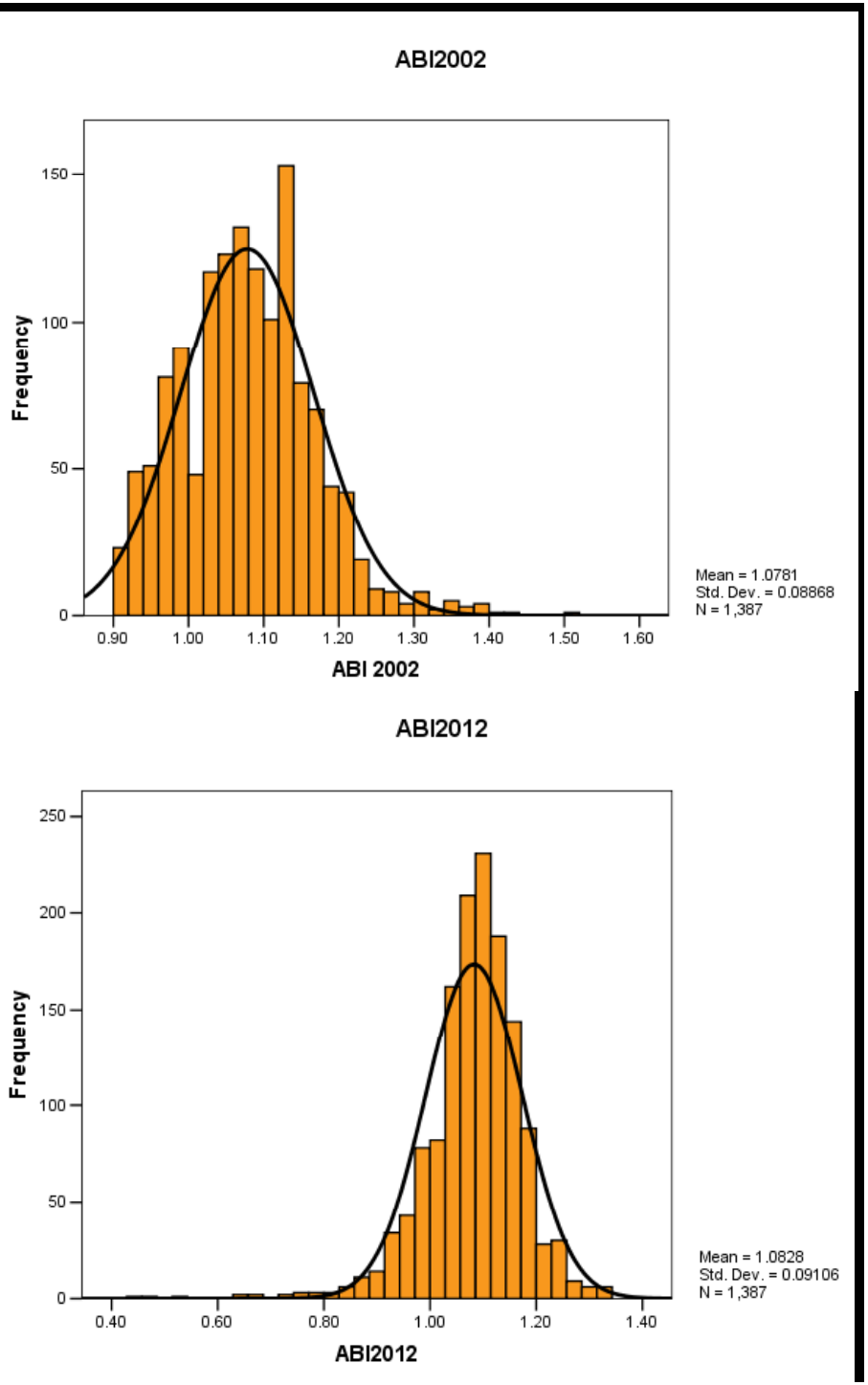

2002
2,209 EGAT employee
No PAD from normal ABI
2012
1,427 with previous normal ABI
1,387 with complete data of ABI this year
follow up


1,427 EGAT study employee
who had no peripheral artery disease at 2002
(ABI ≥0.9)
40 subjects were excluded because of unavailable ABI at 2012.
A total 1,387 employee for research analysis.

Baseline ABI

- 38 subjects (2.74%) from 1,387 subjects that they had ABI < 0.9 at 2012.
- 38 subjects were considered as the subjects who had peripheral artery disease for this research.
- Normal distribution test

  >> Not acceptable
  (K-S test, 2002 p-value 0.001 and 2012 p-value <0.001)



10-years PAD Incidence

- Unstandardized : 2.74 % (n=1,387)
- Age-adjusted : 2.86% (based on n= 80,642)
- Sex-adjusted: 2.65% (based on n=2,418)

Baseline of cardiovascular risks characteristics

		Mean ± SD	n	n %
Age at 2002 (years) (n=1,387)		59 ± 5		
Age group(n=1,387)	50-54 Y		294	21.20%
	55-59		560	40.37%
	60-64		337	24.30%
	equal or more than 65		196	14.13%
Gender (n=1,387)	Female		1029	74.19%
	Male		358	25.81%
Hypertension (n=1,387)	Have no hypertension		594	42.83%
	Have hypertension		793	57.17%
Smoking (n=1,370)	Nonsmoker		664	48.47%
	Smoker (Both current and former)		706	51.53%
Diabetes mellitus (n=1,384)	Have no Diabetes mellitus		1080	78.03%
	Have Diabetes mellitus		304	21.97%

Baseline of cardiovascular risks characteristics

		Mean ± SD	n	n %
Stroke (n=1,387)	Have not experienced stroke		1360	98.05%
	Have experienced stroke		27	1.95%
Dyslipidemia (n=1,387)	Have no dyslipidemia		449	32.37%
	Have dyslipidemia		938	67.63%
Coronary artery stenosis (n=1,387)	Have no previous coronary artery stenosis		1310	94.45%
	Have previous coronary artery stenosis		77	5.55%
Previous myocardial infarction (n=1,387)	Have no previous MI		1374	99.06%
	Have previous MI		13	0.94%
Weight (kg) (n=1,361)		64.20 ± 10.75		
Height (cm) (n=1,361)		161.55 ± 7.65		
BMI (kg/m^2) (n=1,361)		24.59 ± 3.74		
BMI (n=1,361)	Normal (BMI < 25)		788	57.90%
	Overweight (30> BMI >= 25)		489	35.93%
	Obesity (BMI >= 30)		84	6.17%

Baseline of cardiovascular risks characteristics

		Mean ± SD	n	n %
Age risk (n=1,387)	Male <= 55 and Female <=65 years		1031	74.33%
	Male > 55 and Female > 65 years		356	25.67%
Chronic Kidney Disease (n= 1,387)	No CKD as underlying disease		1350	97.33%
	Have CKD as underlying disease		37	2.67%
GFR (ml/min) (n=1,370)		67.69 ± 20.93		
GFR (n=1,370)	Normal GFR		846	61.75%
	Abnormal GFR (< 60 ml/min)		524	38.25%
Blood pressure test assessment (n=1,377)	Normal BP both assessments		1002	72.77%
	High BP >140/90 for 2 times of assessments.		375	27.23%

Baseline of cardiovascular risks characteristics

		Mean ± SD	n	n %
Resting blood pressure assessment				
1st blood pressure assessment (n= 1,382)				
Systolic blood pressure (mmHg)		**133 ± 19**		
Systolic blood pressure	**SBP1 Normal**		**915**	**66.21%**
	SBP1 >140 mmHg		**467**	**33.79%**
Dystolic blood pressure (mmHg)		**77 ±11**		
Dystolic blood pressure	**DBP1 normal**		**1220**	**88.28%**
	DBP1 > 90 mmHg		**162**	**11.72%**
Blood pressure	**Normal BP1**		**876**	**63.39%**
	Abnormal BP1 (>140/90)		**506**	**36.61%**

Baseline of cardiovascular risks characteristics

		Mean ± SD	n	n %
2nd blood pressure assessment (n= 1,377)		133 ± 19		
Systolic blood pressure (mmHg)				
Systolic blood pressure	SBP2 Normal		937	68.05%
	SBP2 >140 mmHg		440	31.95%
Dystolic blood pressure (mmHg)		77 ± 11		
Dystolic blood pressure	DBP2 normal		1227	89.11%
	DBP2 > 90 mmHg		150	10.89%
Blood pressure	Normal BP2		899	65.29%
	Abnormal BP2 (>140/90)		478	34.71%

Baseline of cardiovascular risks characteristics

		Mean ± SD	n	n %
Cardio-Ankle Vascular Index 2012 (CAVI) (n=1,377)				
Right CAVI score		9.06 ± 1.22		
Left CAVI score		8.97 ± 1.22		
CAVI criteria	Normal (CAVI score 8.0)		175	12.71%
	Border line (9 > CAVI >=8)		402	29.19%
	Possible CAVI >=9 Arteroisclerosis		800	58.10%
Ankle Brachial Index at 2002				
Ankle Brachial Index	Normal		1,387	100.00%
(n=1,387)	Abnormal (ABI <0.9)		0	0.00%
Ankle Brachial Index at 2012				
Ankle Brachial Index	Normal		1349	97.26%
(n=1,387)	Abnormal (ABI <0.9)		38	2.74%

Baseline of cardiovascular risks characteristics

		Mean ± SD	n	n %
Ankle Brachial Index at 2002				
Left Ankle Brachial Index (n=1,387)		1.10 ± 0.09		
Left Ankle Brachial Index	Normal		1,387	100.00%
	Abnormal (ABI <0.9)		0	0.00%
Right Ankle Brachial Index (n=1,387)		1.12 ± 0.10		
Right Ankle Brachial Index	Normal		1,387	100.00%
	Abnormal (ABI <0.9)		0	0.00%
Ankle Brachial Index	Normal		1,387	100.00%
(n=1,387)	Abnormal (ABI <0.9)		0	0.00%
Ankle Brachial Index at 2012				
Left Ankle Brachial Index (n=1,387)		1.11 ± 0.10		
Right Ankle Brachial Index (n=1,387)		1.12 ± 0.09		
Ankle Brachial Index	Normal		1349	97.26%
(n=1,387)	Abnormal (ABI <0.9)		38	2.74%

Baseline of cardiovascular risks characteristics

		Mean ± SD	n	n %
Fasting blood glucose (FBS) and HbA1C Test				
Fasting blood glucose (FBS) (mg/dl) Test (n=1,386)		**99 ± 22**		
Fasting blood glucose	**Normal**		**1261**	**90.98%**
	Abnormal (FBS >=126)		**125**	**9.02%**
HbA1C (n=1,386)		**6.0 ± 0.8**		
HbA1C	**Normal**		**1204**	**86.87%**
	Abnormal (HbA1C > 6.5%)		**182**	**13.13%**

Baseline of cardiovascular risks characteristics

		Mean ± SD	n	n %
Lipid profile test				
Total Cholesterol (n=1,386)		204 ± 44		
Cholesterol level	Less than 240 mg/dL		1109	80.01%
	Equal or more than 240 mg/dL		277	19.99%
Triglyceride (n=1,386)		121 ± 61		
Triglyceride level	Less than 200 mg/dL		1266	91.34%
	Equal or more than 200 mg/dL		120	8.66%
HDLC (n=1,386)		59 ± 16		
HDLC level	Equal or more than 40 mg/dL		1293	93.29%
	Less than 40 mg/dL		93	6.71%
LDLC (n=1,386)		132 ± 40		
LDLC level	Less than160 mg/dL		1079	77.85%
	Equal or more than 160 mg/dL		307	22.15%
Lipid Profile test (n=1,386)	Normal lipid profile test		931	67.17%
	Abnormal lipid profile test		455	32.83%

Univariate analysis
Demonstrate predictors of year 10th PAD

Univariate logistic regression results:

>> Significant risks of Year 10th PAD

1. **Dyslipidemia**
2. **Male with more 55 or female more 65 years**
3. **Chronic kidney disease**
4. **FBS equal or more than 126 mg/dl**
5. **HbA1C more than 6.5%**
6. **Triglyceride equal or more than 200 mg/dl**
7. **HDLC less than 40 mg/dl**
8. **Stroke History**

Univariate analysis results

Risks		N	Year 10 PAD		Odd ratio	95%CI	p-Value
			n	(%)			
Age		1,387	38	2.77%	1.077	1.013 to 1.145	0.018*
Age group (n=1,387)	50-54 Y	294	7	2.38%		Reference	
	55-59	560	9	1.61%	0.670	0.247 to 1.817	0.431
	60-64	337	13	3.86%	1.645	0.647 to 4.180	0.295
	equal or more than 65	196	9	4.59%	1.973	0.722 to 5.389	0.185
Gender (n=1,387)	Female	1029	26	2.53%		Reference	
	Male	358	12	3.35%	1.338	0.668 to 2.680	0.412
Hypertension	Have no hypertension	594	11	1.85%		Reference	
(n=1,387)	Have hypertension	793	27	3.40%	1.868	0.919 to 3.797	0.084
Smoking (n=1,370)	Nonsmoker	664	15	2.26%		Reference	
	Smoker	706	23	3.26%	1.457	0.754 to 2.817	0.263
Diabetes mellitus	No	1080	25	2.31%		Reference	
(n=1,384)	Yes	304	12	3.95%	1.734	0.861 to 3.494	0.123

Univariate analysis
Demonstrate predictors of year 10th PAD

Risks		N	Year 10 PAD		Odd ratio	95%CI	p-Value
			n	(%)			
Stroke (n=1,387)	No	1360	35	2.57%		Reference	
	Yes	27	3	11.11%	4.732	1.361 to 16.455	0.015
Dyslipidemia (n=1,387)	No	449	5	1.11%		Reference	
	Yes	938	33	3.52%	3.238	1.256 to 8.351	0.015
Previous CAD	No	1307	38	2.77%			
(n=1,387)	Yes	80	0	0.00%	-	-	-
BMI (n=1,361)	Normal weight	788	16	2.03%		Reference	
	Over weight	489	17	3.48%	1.738	0.870 to 3.472	0.118
	Obesity	84	2	2.38%	1.177	0.266 to 5.209	0.830
Male > 55 or Female >	No	1031	23	2.23%		Reference	
65 years (n=1,387)	Yes	356	15	4.21%	1.928	0.994 to 3.737	0.052
CKD	No CKD	1350	33	2.44%		Reference	
(n= 1,387)	Have CKD	37	5	13.51%	6.236	2.285 to 17.016	<0.001

Univariate analysis
Demonstrate predictors of year 10th PAD

Risks		N	Year 10 PAD		Odd ratio	95%CI	p-Value
			n	(%)			
GFR (n=1,370)	>=60 ml/min	846	17	2.01%		Reference	0.073
	< 60 ml/min	524	19	3.63%	1.835	0.945 to 3.563	
BP assessment	<=140/90 mmHg	1002	25	2.50%		Reference	
(2times) (n=1,377)	>140/90 mmHg	375	13	3.47%	1.403	0.710 to 2.773	0.329
Fasting blood	< 126 mg/dl	1261	28	2.22%		Reference	
glucose (n=1,386)	>=126 mg/dl	125	10	8.00%	3.829	1.814 to 8.081	<0.001
HbA1C (n=1,386)	<=6.5%	1204	26	2.16%		Reference	
	> 6.5%	182	12	6.59%	3.198	1.584 to 6.458	0.001
FBS /HbA1C	< 126 mg/dl and <=6.5%	1166	25	2.14%		Reference	
(n=1,386)	>=126 mg/dl and/or > 6.5%	220	4	3.01%	2.866	1.443 to 5.694	0.003

Univariate analysis
Demonstrate predictors of year 10th PAD

Risks		N	Year 10 PAD		Odd ratio	95%CI	p-Value
			n	(%)			
Cholesterol level	< 240 mg/dL	1109	30	2.71%		Reference	
(n=1,386)	>= 240 mg/dL	277	8	2.89%	1.070	0.485 to 2.360	0.868
Triglyceride level	< 200 mg/dL	1266	30	2.37%		Reference	
(n=1,386)	>= 200 mg/dL	120	8	6.67%	2.943	1.318 to 6.573	0.008
HDLC level	>= 40 mg/dL	1293	29	2.24%		Reference	
(n=1,386)	< 40 mg/dL	93	9	9.68%	4.670	2.141 to 10.185	<0.001
LDLC level (n=1,386)	<160 mg/dL	1079	27	2.50%		Reference	
	>= 160 mg/dL	307	11	3.58%	1.448	0.710 to 2.953	0.309
Lipid Profile test	Normal	931	19	2.04%		Reference	
(n=1,386)	Abnormal	455	19	4.18%	2.092	1.096 to 3.991	0.025

Multivariate analysis

- **Multivariate logistic regression analysis, backward stepwise method**
- **Predictors from univariate analysis with *p*-value < 0.10 were entered in the multivariate analysis**
    1. **Age**
    2. **Hypertension**
    3. **Dyslipidemia**
    4. **Male with more 55 or female more 65 years**
    5. **Chronic kidney disease**
    6. **GFR abnormality**
    7. **Triglyceride abnormality**
    8. **HDLC abnormality**
    9. **Fasting blood sugar or HbA1C abnormality**
    10. **Stroke/TIA History**

A total 1,370 subjects who had completed data were analyzed.

Multivariate analysis

The significant predictors of year 10th PAD were

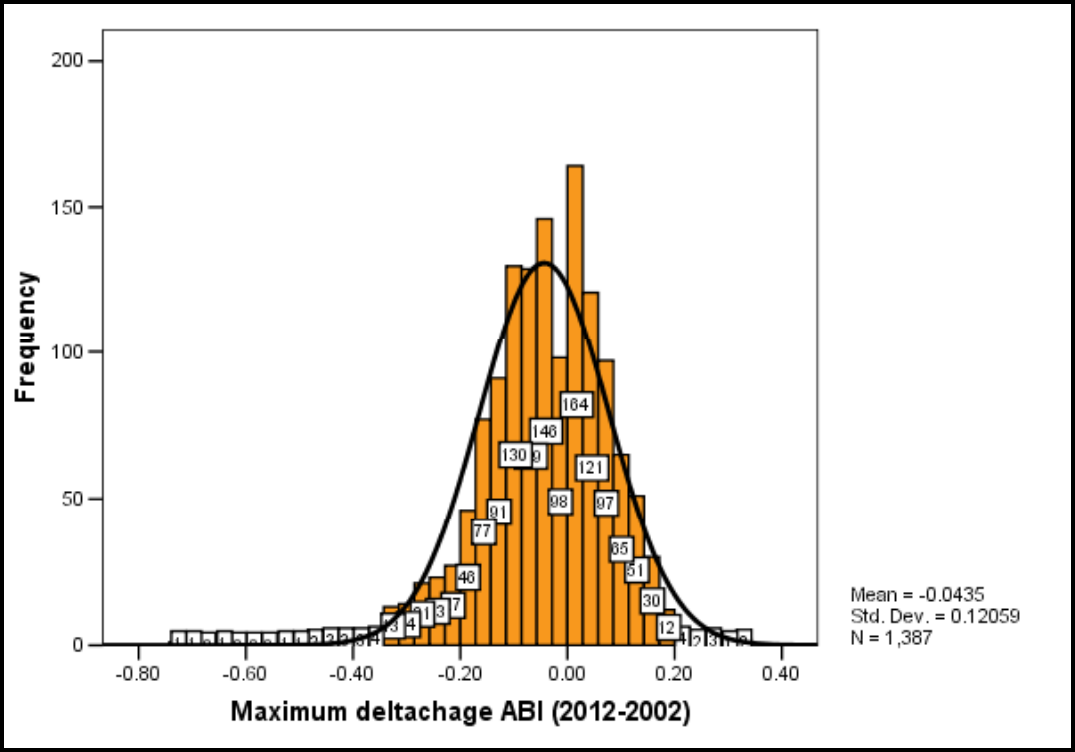
1. **Chronic kidney disease**
2. **FBS >=126 mg/dl and/or HbA1C > 6.5%**
3. **Dyslipidemia**
4. **HDL-cholesterol (<40 mg/dL)**
5. **Stroke /TIA history**

Age also was a important factor.

Multivariate analysis

	B	S.E.	Wald	Sig.	Odd ratio	95 % C.I.	
Age2002	0.065	0.034	3.583	0.058*	1.067	0.998	1.142
Dyslipidemia	1.319	0.545	5.856	0.016*	3.738	1.285	10.877
HDL < 40 mg/dL	1.405	0.424	10.996	0.001*	4.074	1.776	9.344
FBS >=126 mg/dl and/or HbA1C > 6.5%	0.924	0.366	6.365	0.012*	2.520	1.229	5.168
Chronic kidney disease	1.397	0.554	6.355	0.012*	4.041	1.365	11.970
Stroke	1.554	0.660	5.545	0.019*	4.732	1.298	17.257
Constant	-9.131	2.160	17.862	0.000	0.000		

Relationship between changes of ABI and PAD



Mean different Changes of ABI for ten years (n=1,387)

-0.04 ± 0.12

95%CI= -0.05 to -0.04

The changes of ABI were divided in to 3 equal groups at

Percentiles 33.33 = -0.08 and Percentiles 66.67 = 0.01

Group 1 **ABI increased from baseline more than 0.01.**

Group 2 **ABI increased from baseline equal or less than 0.01 but not decreased from baseline more than 0.08.**

Group 3 **ABI decreased from baseline equal or more than 0.08.**

Relationship between changes of ABI and PAD

Pearson chi-square used for analysis relationship between PAD and changes of ABI.

The previous ABI changes group 1 and group 2 were integrated into the same group.

Group 1 =ABI decreased from baseline less than 0.08

Group 2= ABI decreased from baseline equal or more than 0.08

		2012							
		ABI > = 0.9 Considered as no PAD (N=1,349)				ABI < 0.9 considered as PAD (N=38)			
		Count	Row N %	Column N %	Table N %	Count	Row N %	Column N %	Table N %
ABI 2012	Decreased < 0.08 (N= 857)	886	99.89 %	65.68%	63.88%	1	0.11%	2.63%	0.07%
	Decreased > = 0.08 (N=481)	463	92.60 %	34.32%	33.38%	37	7.40%	97.37%	2.67%

Pearson chi-square analysis shown significant difference between PAD and ABI changes (*p-value* <0.001).

Relationship between changes of ABI and Risk factors

- **Relationship between the ABI changes groups and 5 significant risks of PAD from multivariate analysis were also analyzed by Pearson chi-square.**
- **The results shown significant relation between HDL-Cholesterol level and the ABI changes groups (*p-value* = 0.024) and between fasting blood sugar level and/or HbA1C > 6.5% and the ABI changes groups (*p-value* = 0.027).**

Changes of ABI		N	Column N		*p-value*[a]
			Group 1 ABI decreased from baseline less than 0.08.	Group 2 ABI decreased from baseline equal or more than 0.08	
Peripheral artery disease diagnosed at next 10 years	No	1349	886 (65.7%)	463 (34.3%)	<0.001*
	Yes	38	1 (2.6%)	37(97.4%)	
Stroke	No	1360	873(64.2%)	487(35.8%)	0.263
	Yes	27	14(51.9%)	13 (48.1%)	
Dyslipidemia	No	449	282 (62.81%)	167 (37.19%)	0.579
	Yes	938	605 (64.5%)	333 (35.5%)	
Chronic kidney disease	No	1350	869 (64.4%)	481 (35.6%)	0.073
	Yes	37	18 (48.6%)	19 (51.4%)	
HDLC < 40 mg/dL	No	1293	838 (64.8%)	455 (35.2%)	0.025*
	Yes	93	49(52.7%)	44(47.3%)	
FBS >=126 mg/dl and/or HbA1C > 6.5%	No	1166	761(65.3%)	405 (34.7%)	0.029*
	Yes	220	126 (57.3%)	94 (42.7%)	

Relationship between Cardio-ankle vascular index (CAVI) and PAD

- **Cardio-ankle vascular index (CAVI) mean between patients with PAD and without PAD was compared by t-test.**
- **There was no significant difference of CAVI between the patients who had PAD diagnosed by ABI.**

Cardio-ankle vascular index		Peripheral artery disease diagnosed		*p-value*
		ABI >= 0.9	ABI < 0.9	
		No	Yes	
n		1,339	38	0.575[a]
Mean ± SD		9.18 ± 1.25	9.37 ± 1.98	
N of Age adjusted		78,663	2,303	<0.001*
Mean ± SD		9.21±1.25	9.42 ± 1.95	
Cardio-ankle vascular index criteria N(%)				
Normal (CAVI < 8.0)	175	169 (96.6%)	6 (3.4%)	
Border line and (9 > CAVI >=8)	402	390 (97.0%)	12 (3.0%)	0.752[b]
Possible Arteroisclerosis (CAVI >=9)	800	780 (97.5%)	20 (2.5%)	

[a]t-test [b]Pearson chi-square

Conclusion

- Incidence of PAD diagnosed by abnormal ABI <0.9, in the past 10 years from EGAT population was 2.74%.

Univariate analysis

- **Significant RFs for year 10th PAD were dyslipidemia ,male with more 55 or female more 65 years, CKD, FBS ≥126 mg/dl, HbA1C > 6.5% ,Triglyceride ≥200 mg/d,HDL <40 mg/dl,stroke history**

Multivariate analysis

The significant predictors of year 10th PAD were

1. **Chronic kidney disease**
2. **FBS >=126 mg/dl and/or HbA1C > 6.5%**
3. **Dyslipidemia**
4. **HDL-cholesterol (<40 mg/dL)**
5. **Stroke /TIA history**

- Age was also important.

- Delta change of ABI
- When the change value decreases more than 0.08 , it relates to the development of PAD in the next 10 years.
- Risk factors: FBS >= 126mg/dl, HDL<40 mg/dl

Limitations of the study

- There is no ethinicity difference.
- This represents only the middle-class populations for Thailand
- Limited number of patients who have been followed up in both times.

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