

Nursing Care for Patients with Cardiovascular Disease in Day Care Center

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김혜영

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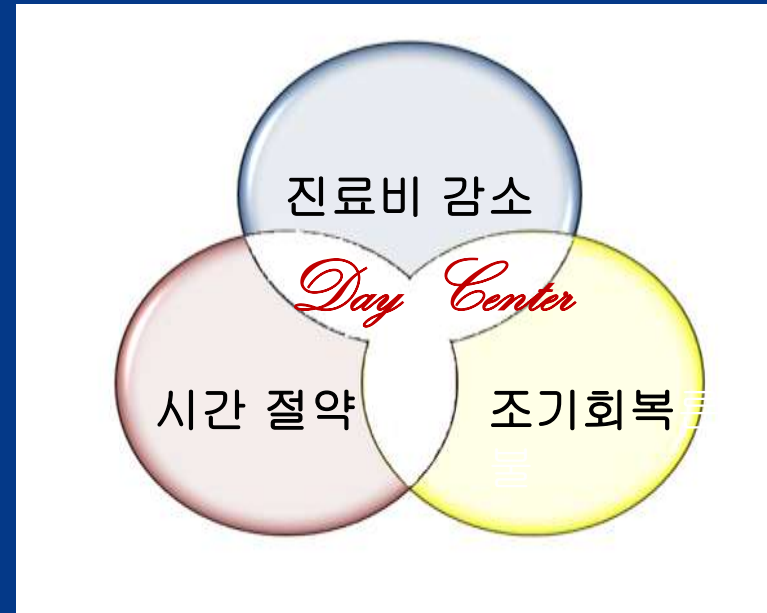
DAY CARE CENTER

- Usage
- Case Comparison

CAG 당일 입원

검사 진행

당일 퇴원 가능



환자 만족

Day Care Center 이점 및 다양성

환자측

입원으로 인한 불편감 감소

심리적 부담 감소

대기시간 단축

진료비 부담이 감소

병원감염에 노출될 위험성 감소

일상으로의 복귀가 빨라짐

병원측

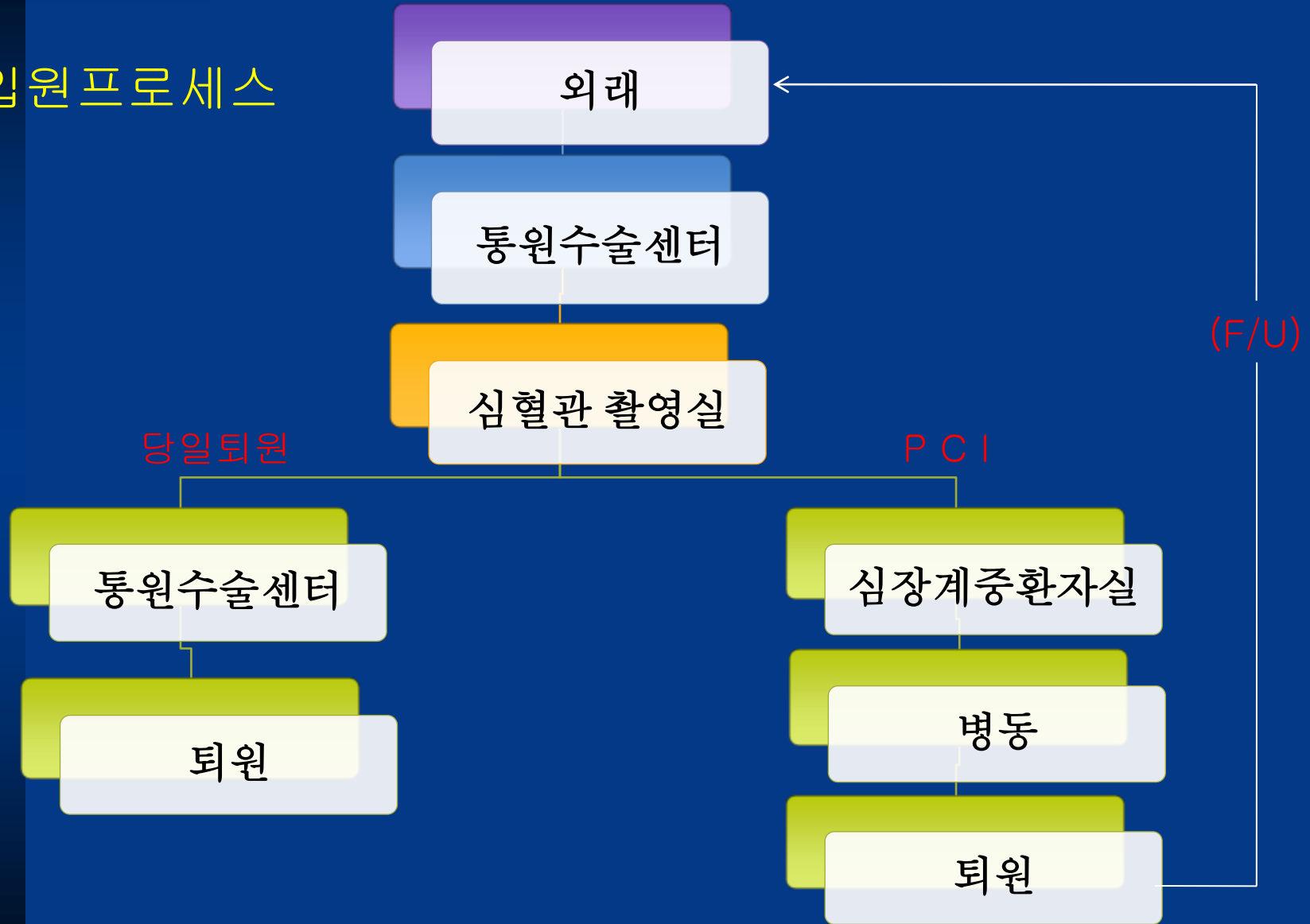
입원 병실이 부족한 문제점을 해결

병상 회전을 상승

재원일수 감소 (입원 기간 단축)

병원수입 증가

입원프로세스

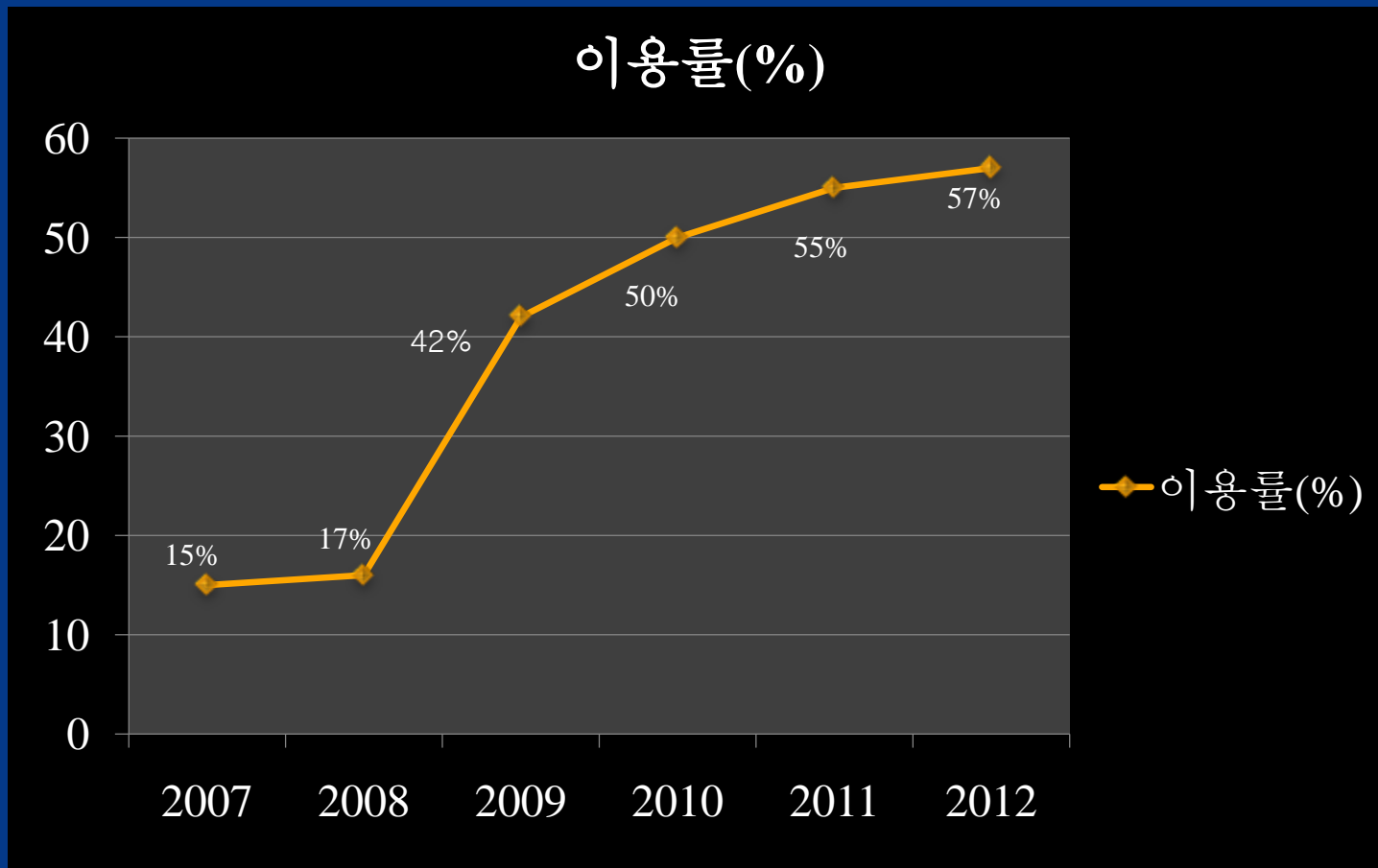


- 접근성
- 공간적 제한
- 환자수의 증가
- 공간,인력,장비,프로세스
- 상호협조

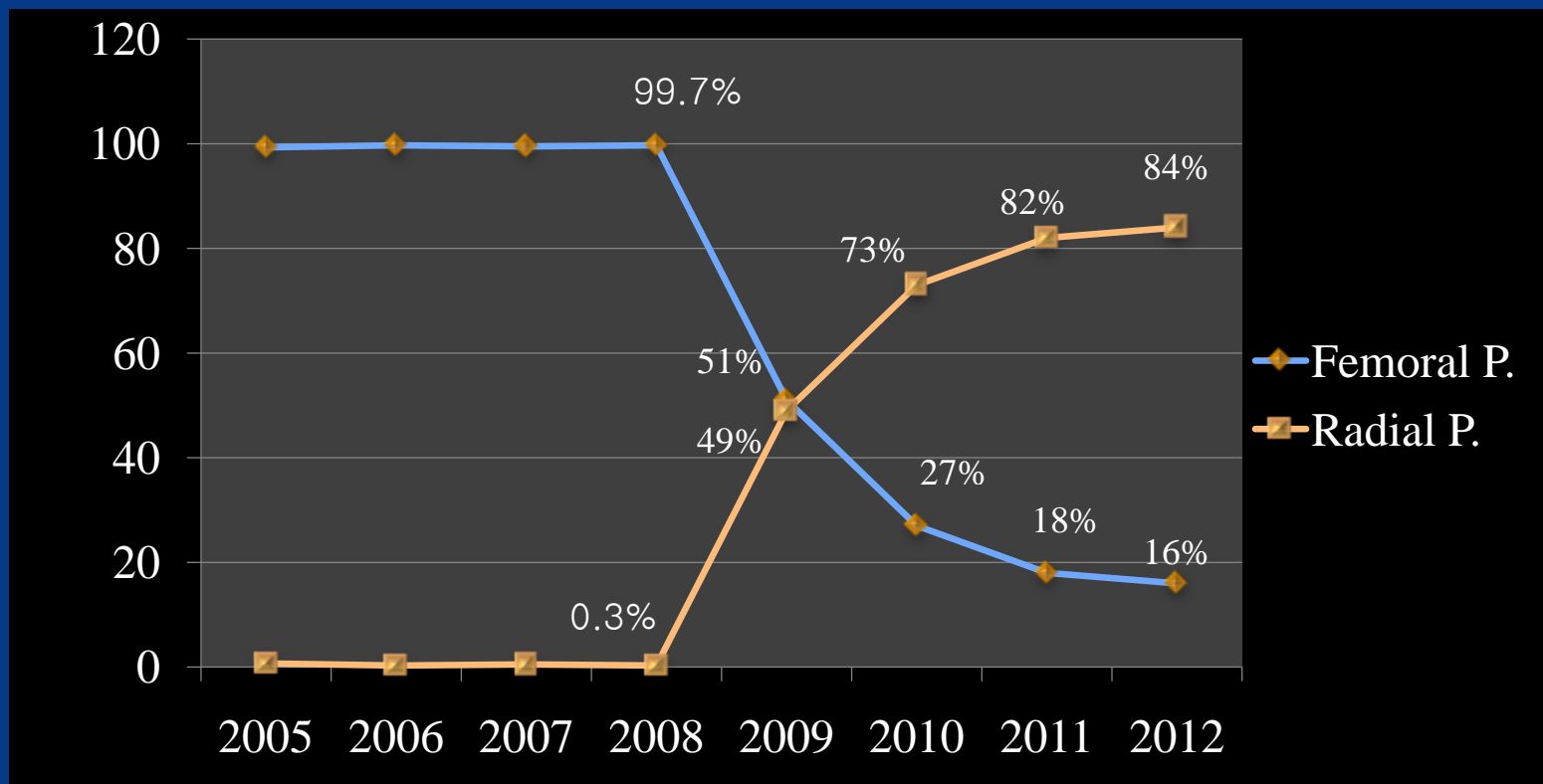
(CCU,DSC,CATH LAB)



연도별 이용 현황(CAG)



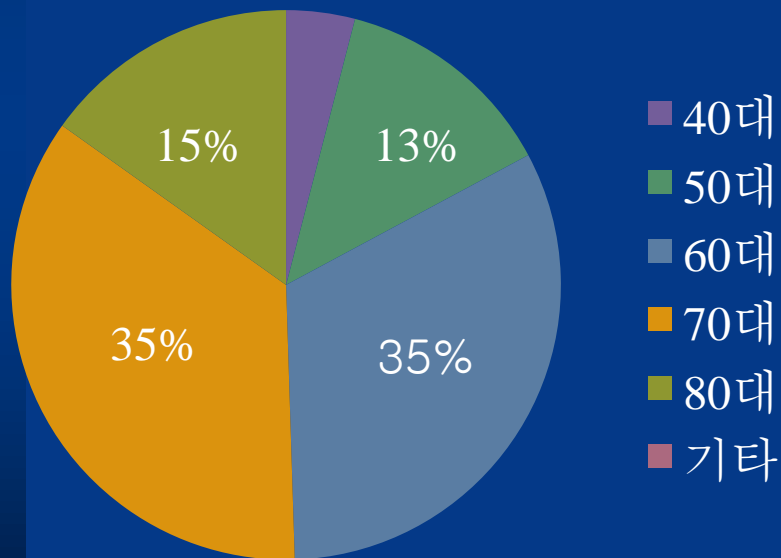
Radial A. vs Femoral A.(CAG)



Day Center 이용 연령 분포(CAG)

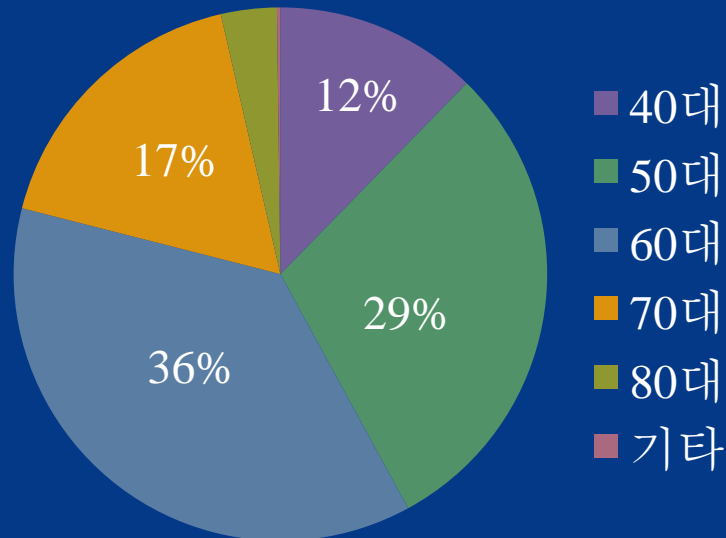
입원 연령

%



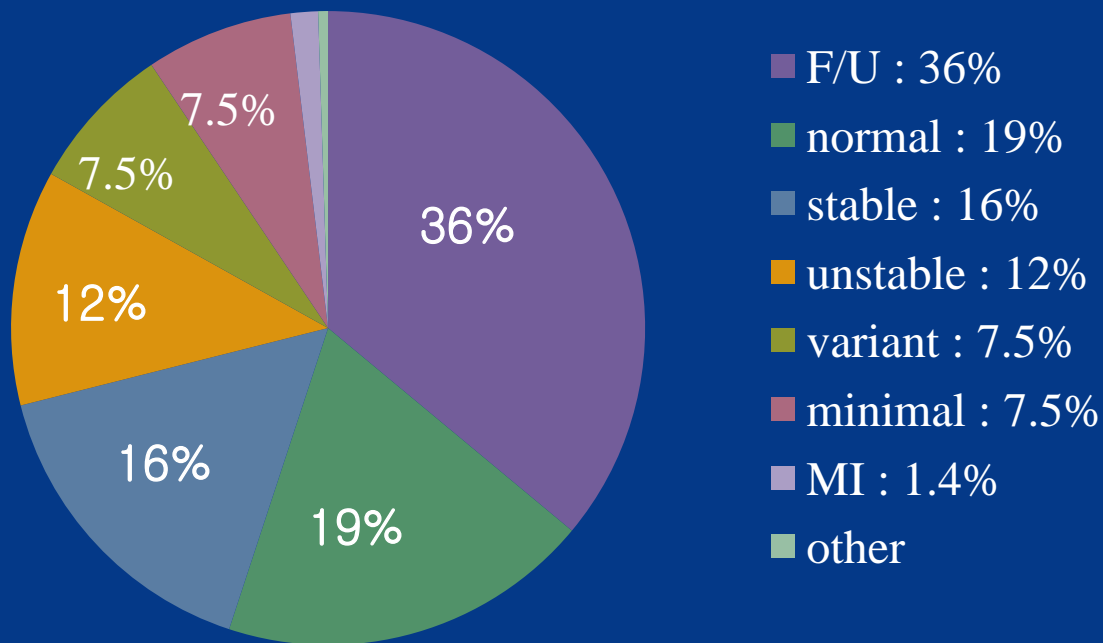
DAY CENTER 연령분포

%



2011년 기준

Day Center의 질환별 이용현황(CAG)



2011년 기준

사례 1. 병동 입원을 통한

Chief Complaint

Exertional pain

- Onset : 2011. 10월경부터
- Radiation : (-)
- 2008 CT 50-60% LESION IN RCA
- >2011 CT 70% LESION IN RCA

Present illness

76세 남자 환자로 2001년에 variant angina 진단받고 Medication하는 환자로 2011년 10월에 시행한 CT상 2008년도 CT와 비교하여 RCA stenosis 증가 소견 보여 CAG위해 입원하심

History

Past History

- DM(-) / HBP(+) / TB(-) / Hepatitis(-)

Social History : smoking denied

Family History : (-)

입원 프로세스



1일 입원 수속
16:00



처치, 숙박



2일 검사실
10:30



지혈 확인
14:30



3일 퇴원
09:00



귀가
11:00

Total 43 시간소요

사례 2. Day Care Center를 통한

Chief Complaint

Chest Pain

- Age & Sex : M / 57
- Radiation : (-)

- Onset : 2012.3월경 부터
- NIG response : (+)

History

Past History

- DM(-) / HBP(+) / TB(-) / Hepatitis(-)
- 2006년 10월 1VESSEL PCI (pLAD Taxus 4.0/24)

Social History : smoking denied

Family History : (-)

Medication

Statin

Aspirin

Pregrel

Angiotensin II receptor antagonist

당일 입 퇴원 프로세스



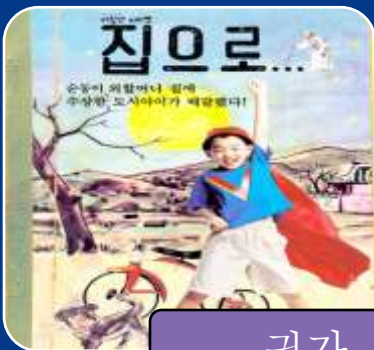
접수
08:59



DSC 대기
9:00-10:15



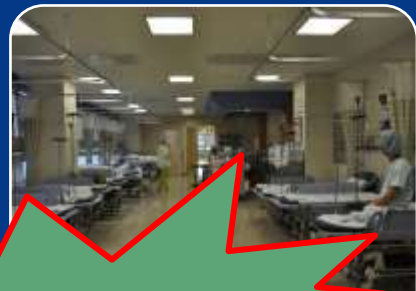
검사실이동
10:15



귀가
15:00



지혈
11:25



안정실
11:25

Total 6시간소요

Ward & Day Care Center

병동입원

다양한 검사 (입원기간)
충분한 시간 (시술 전 준비 및 시술 후 간호)

DAY CENTER

시간절약
비용절감
입원으로 인한 불편감 감소
불안 감소
빠른 생활로의 복귀

Preparation before CAG

- Preparation before Admission
- Preparation in Day Care Center

Preparation before Admission

- Obtain Permission
- LAB data Confirmation
- Cardiac Function test
- Entry site Decision
- Medication

Preparation before Admission

- Obtain Permission
- LAB data Confirmation
- Cardiac Function test
- Entry site Decision
- Medication



2. 시술명 : 심도자 검사 및 관상동맥 조영술 , 시술의 : 김병근

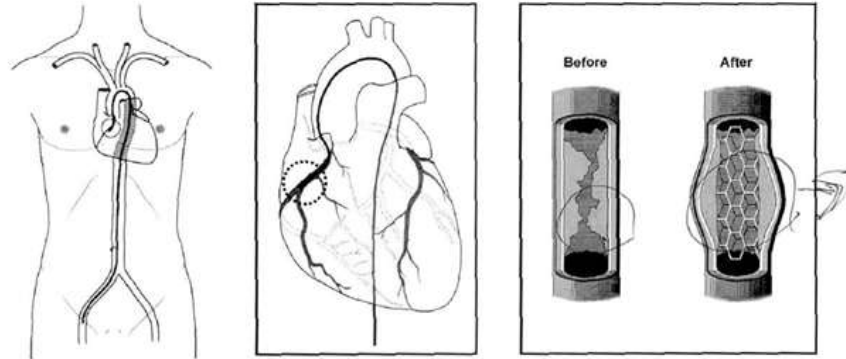
3. 검사의 목적(적응증)

1) 심도자검사

이 검사는 심장판막이 좁아져서 혈액이 원활히 흐르지 않거나 제대로 닫히지 않아서 혈액이 역류하는 심장판막질환(승모판 협착 및 폐쇄부전증, 대동맥판 협착 및 폐쇄부전증), 출생시부터 심장과 혈관의 구조가 비정상적인 선천성 심장질환(심방 또는 심실 중격결손증, 동맥관증), 대동맥 및 폐동맥 이상질환, 심장근육 이상질환(비후성, 확장성 심근염) 등을 정확하게 진단하여 앞으로의 치료방침과 환자의 예후를 결정하기 위해 시행합니다.

2) 관상동맥 조영술

관상동맥이란 심장근육에 혈액을 공급하는 혈관으로서 동맥경화나 혈관수축으로 이러한 혈관이 좁아지는 병을 협심증이라 하며, 완전히 막혀버리면 이를 가리켜 심근경색증이라고 합니다. 이 검사는 좁아져 있는 관상동맥의 부위 및 그 정도를 정확히 평가하여 추후의 치료방침 (약물요법, 풍선확장술, 관상동맥 우회수술)과 환자의 예후를 결정하기 위해 시행합니다.



4. 검사 방법 및 시술의 성공 가능성 추가

우측 사타구니에 국소마취를 한 후, 대동맥과 정맥에 가는 바늘로 혈관을 찾은 후, 이 혈관을 통해 가늘고 긴 특수한 플라스틱 튜브를 심장 또는 심장 입구에 위치한 좌, 우 관상동맥에 삽입한 후 조영제를 주입하면서 심장 및 관상동맥의 구조를 밝혀 냅니다. 이 검사에는 약 3분 - 1시간 정도가 소요되며 검사 도중 통증은 없으나, 가끔씩 오심, 구토, 열감 등을 느낄 수도 있습니다.

Preparation before Admission

- Obtain Permission
- **LAB data Confirmation**
- Cardiac Function test
- Entry site Decision
- Medication



<CBC>

- Hemoglobin(13.0–18.0g/dl)
- Hematocrit(40.0–54.0%)
- platelet(150–450 10⁹/l)

<BC>

- Glucose(50–100mg/dl)
- Creatinine(0.6–1.2mg/dl)
- Sodium (136–146 mEq/L)
- Potassium (3.5–5.1 mEq/L)

<PT/PTT, INR>

- PT(10.1–14.0sec), PTT(21.0–38.0sec)
- INR(0.85–1.13)

<Immunology>

- Hepatitis, HIV, Syphilis

Preparation before Admission

- Obtain Permission
- LAB data Confirmation
- **Cardiac Function test**
- Entry site Decision
- Medication



<EKG>

- ST change (elevation, depression) ,
Q wave, Arrhythmia

<Chest x-ray>

- Cardiomegaly, Pulmonary edema,
Pleural effusion

<24hr Holter monitor>

- Average heart rate, presence of pause,
A-V block, VPC, V-Tach

<Treadmill test >

- (+) or (-)

<Echocardiogram>

- LVEF, Segmental wall motion, AS, AR,
MS, MR, Pulmonary hypertension

<Coronary CT>

- Coronary stenosis

Preparation before Admission

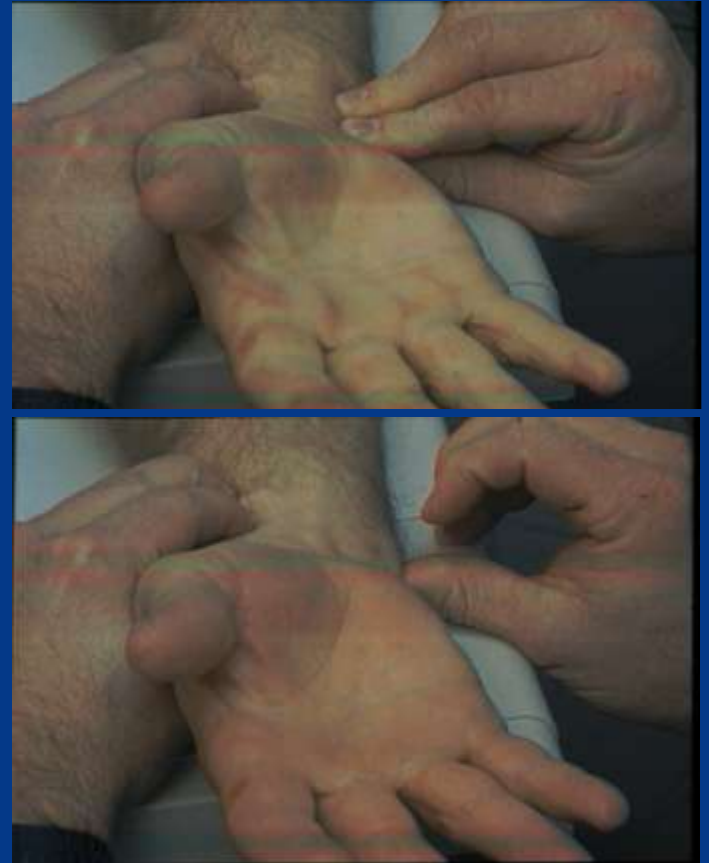
- Obtain Permission
- LAB data Confirmation
- Cardiac Function test
- **Entry site Decision**
- Medication

Ideal Candidates for Transradial Access

- The population who have dual circulation to the hand
- Obese individuals who are at increased risk of complications from transfemoral access
- Individuals with severe peripheral vascular disease

Allen's Test

- **Goal** : test of the collateral radial and ulnar circulation
- **Re-coloration time**
 - Normal : less than 5seconds
 - Intermediate : 5 to less than 10 seconds
 - Abnormal : more 10 seconds



Preparation before Admission

- Obtain Permission
- LAB data Confirmation
- Cardiac Function test
- Entry site Decision
- Medication



- Dual Anti-platelet therapy
 - Aspirin – 100mg
 - Clopidogrel – 75mg (daily for 5day)
1day (loading) 300 ~ 600mg
 - Ticlopidine 250mg
- Diabetics medication
- Anticoagulants medication
- Calcium channel antagonist or Nitrate

Preparation in Day Care Center

- Check patient
- Normal saline : Keep IV by 10ggt
(have patient peripheral IV catheter in left arm by 20G)
- Entry site checkup
- Permission checkup
- Check LAB results (CBC,BC, PT, Immunology)
- Check Body Weight
- Check allergy (drug & food)

PROCESS

- ANGIO 예약 리스트
- ANGIO SCHEDULE
- DAY CENTER 도착
- 감염질환 확인
- ALLERGY 확인



70227 강원 속초시 [ADR] [임상시험] 순환기내과 [김범준/의사]

정보 접수관리 예약관리 실시관리 ANGIO 결과관리 영상검사관리 조영제재고관리 청구 통

기 접수 통합결과 통합기록 응급실 e노트 마약처방 약품정보 추가정보 수혈간호 처방 바코드

■ 약물유해반응(ADR)/Allergy

▶ Allergy관리

아래와 같이 약물유해반응이 보고된 바 있는 환자입니다. 처방시 참고하십시오.
또한, 약물유해반응이 의심될 시 의뢰서를 입력하여 주시기 바랍니다.

원인약물	증상	설명	결과/단계	심각도	회신
	조영제 맞고 나서 두드러기, 가려움 증상 동반됨		Conditional(...)		

Post Care after CAG

Post care in Day care Center

- Physical care
 - Check up vital sign & ECG Monitoring
 - Symptom observation
- Education
 - Prevent to contrast induced nephropathy (hydration)
 - Drug Education
- puncture site management

Post care (close observation)

- Vital sign change : dehydration, vasodilatation, bleeding, contrast reaction
- ECG Monitoring : Acute thrombosis
Abrupt vessel closure
Transient coronary spasms
Side branch occlusion
Acute emboli
- Symptom Observation : Chest pain, Dizziness, Vertigo, sweating, Dyspnea, Burning Sensation

Contrast nephropathy

Risk Factors

- Systolic blood pressure <80 mm Hg
- Intra arterial balloon pump
- Congestive heart failure (pulmonary edema)
- Age >75 y
- Hematocrit level <39% for men and <35% for women
- Diabetes
- Contrast media volume
- Renal insufficiency: Serum creatinine level >1.5 g/dL

Preventions to Contrast induced nephropathy

1. The **dose of contrast** medium should be as low as possible, while still being able to perform the necessary examination.
2. IV **fluid hydration** with saline. 1ml/kg per hour for 6–12 hours of 0.45 percent saline before and after the contrast.
3. Some recent studies suggest that N–acetylcysteine protects the kidney from the toxic effects of the contrast agent (Gleeson & Bulugahapitiya 2004). N–acetylcysteine (NAC). NAC, 600 mg orally twice a day, on the day before and of the procedure. if creatinine clearance is estimated to be less than 60 mL/min [1.00 mL/s]).

Solomon et al, 1994; Abizaid et al, 1999

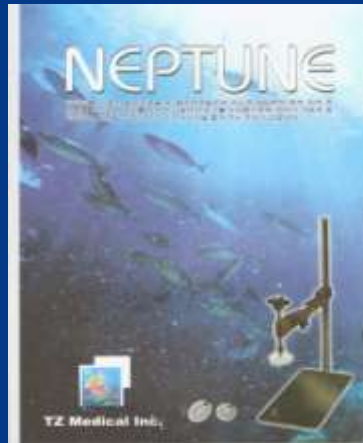
Medication

- **혈전 생성 방지**
 - 증상 재발을 막아 일상생활에 지장이 없도록 함
 - 혈전으로 발생 할 수 있는 2차 질환 예방
 - Antithrombotic agents, Antiplatelet agents
- **심장 근육 허혈 증상 호전 및 예방**
 - 가슴 통증 예방 및 호전 (심근 산소 요구량 감소)
 - Nitrates, Beta blockers, Calcium antagonists, ACE inhibitors
- **죽상 동맥 경화 예방 및 조절**
 - 심혈관 질환의 재발 감소
 - Antihyperlipidemia agents

Puncture Site Care

- Femoral Compression
- Radial Compression

Femoral Compression



Femoral Compression

	Close Device	Mechanical	Manual
장점	Short Compression time Early Ambulation	Hands-free hemostasis Easy to use	Easy to observe patients
단점	Cost-Expensive	Close Observation	Long compression time

Femoral Compression Precautions

- Fixed with a bandage for bleeding
- ABR for 5hr
- Check up distal pulse (dorsalis pedis artery)
- Does not bend is fixed
- If you do not have to walk
- over after checking hemostasis is discharged



RADIAL COMPRESSION








TR Band

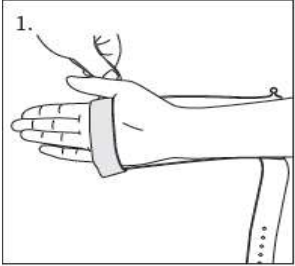
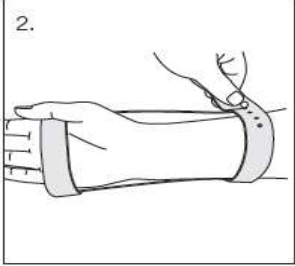
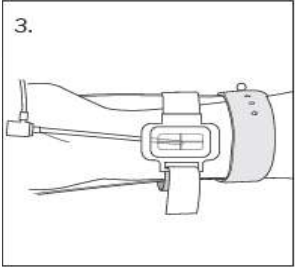
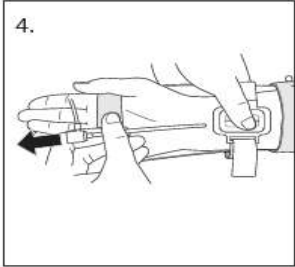
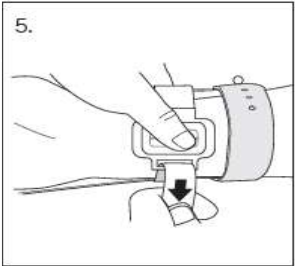
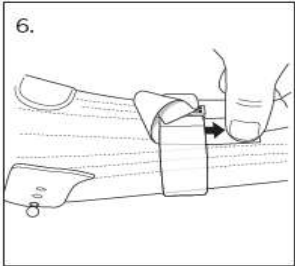
	TR BAND
장점	주사기를 이용한 공기주입 조절이 가능하여 정밀한 압박 압력 측정 가능
	육안으로 지혈상태를 확인하기 가능하도록 투명 소재 사용
단점	재질이 POLYLENE로 되어있어 공기가 통하지 않고 딱딱해서 피부에 자극을 줄 수 있다



RADIALIS S

	RADIALIS	Cosafix® Radialis S - Application Guide
<p>장점</p>	<p>통기성이 있어 피부 짓무름을 유발하지 않으며 통증이나 불편감이 적다</p> <p>back pad가 보조적으로 부착되어 있어서 정맥혈의 순환을 돕고 손저림 현상을 줄여준다.</p>	  
<p>단점</p>	<p>Compression 한 사람에 따라 강도가 다를 수 있다</p> <p>Puncture Site 가 보이지 않아 지혈 상태를 확인하기 어렵다</p>	  

RADISTOP GEN

	RADISTOP GEN	
장점	손목을 넓게 지지해주어 안정감이 있다	 
단점	손목이 가는 사람에게 지혈의 어려움이 있다	 
	타 제품에 비해 고가임	 

Radial Compression Precautions

- Observation : artery occlusion, hypodermic hematoma, hemorrhage, pain, numbness
- 3~4hr Compression Puncture site and skin Confirmation

- Color change
- Temperature
- numbness



Complication

- Bleeding
- Dye Allergy
- Stroke

CASE**Symptom**

- Swelling
- Pain
- Color change
- Ischemic change
- Vital change

Care

- manual compression
- stop anticoagulant
- saline loading
- Transfusion

Risk of Adverse Event after Cardiac Catheterizations by Hemostasis Device

complications	Incidence in the whole population	Collagen plug	Suture device	Manual compression	P value
Bleeding(%)	1.13	0.78	1.15	1.20	<0.001
Vessel occlusion(%)	0.07	0.07	0.07	0.07	NS
Dissection(%)	0.02	0.01	0.02	0.03	0.03
Pseudo aneurysm(%)	0.37	0.17	0.24	0.45	<0.001
Arteriovenous fistula(%)	0.05	0.04	0.05	0.06	0.03
Associated death(%)	0.09	0.03	0.10	0.10	<0.001
Any vascular complication	1.56	1.05	1.48	1.70	<0.001

Phase II J Invas Cardiol 17(12):644-650,2005

Complication TR & TF

Lower Bleeding and Vascular Complications

N = 900 elective PCI patients assigned to transradial (TR), transfemoral (TF), and transbrachial (not shown)

	TR N = 300	TF N = 298	P Value
Successful Coronary Cannulation	93%	99.7%	<.001
PCI Success	91.7%	90.7%	.885
Major Entry Site Bleeding Complications	0	2.0%	.035
Procedural Time (Mean min ± SD)	40 ± 24	38 ± 24	.603
Fluoroscopy Time (Mean min ± SD)	13 ± 11	11 ± 10	.061
Length of Hospital Stay (Mean days ± SD)	1.5 ± 2.5 Range, 0–15	1.8 ± 4.2 Range, 0–39	NS

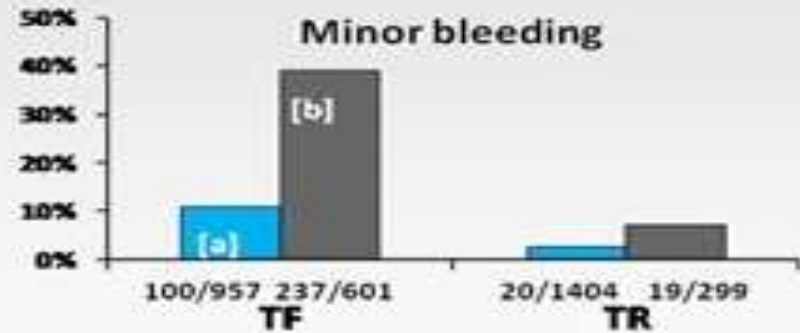
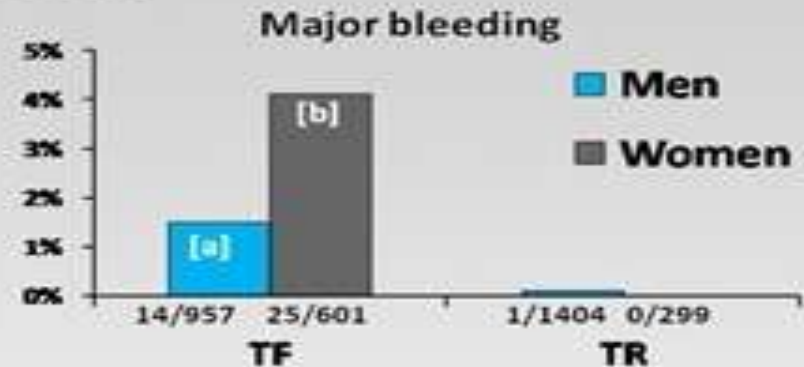
Kiemeneij, et al. J AM Coll Cardiol 1997;29:1269–1275

Radial vs Femoral Access

Radial vs Femoral Access

3261 consecutive PCI and/or diagnostic procedures

- Major bleeding
 - Retroperitoneal hematoma or death
 - Required surgical intervention
 - Required blood transfusions
 - Hg < 4 g/dL
 - Hematoma > 50% of the limb, associated with pt. discomfort and prolonged hospital stay
- Minor bleeding
 - All other puncture-related hemorrhages



a. $P = .00001$ vs radial
 b. $P = .0008$ vs radial

Bleeding Time

N : 900 (TR-PCI 450 TF-PCI 450)
2004-2007

Complication N(%)	0-6h	6-24h	>24h
Access site bleeding(minor)	11(2.4%)	None	None
Access site bleeding(major)	7(1.8%)	2(0.2%)	None

CASE

Chief Complaint

Atypical chest pain

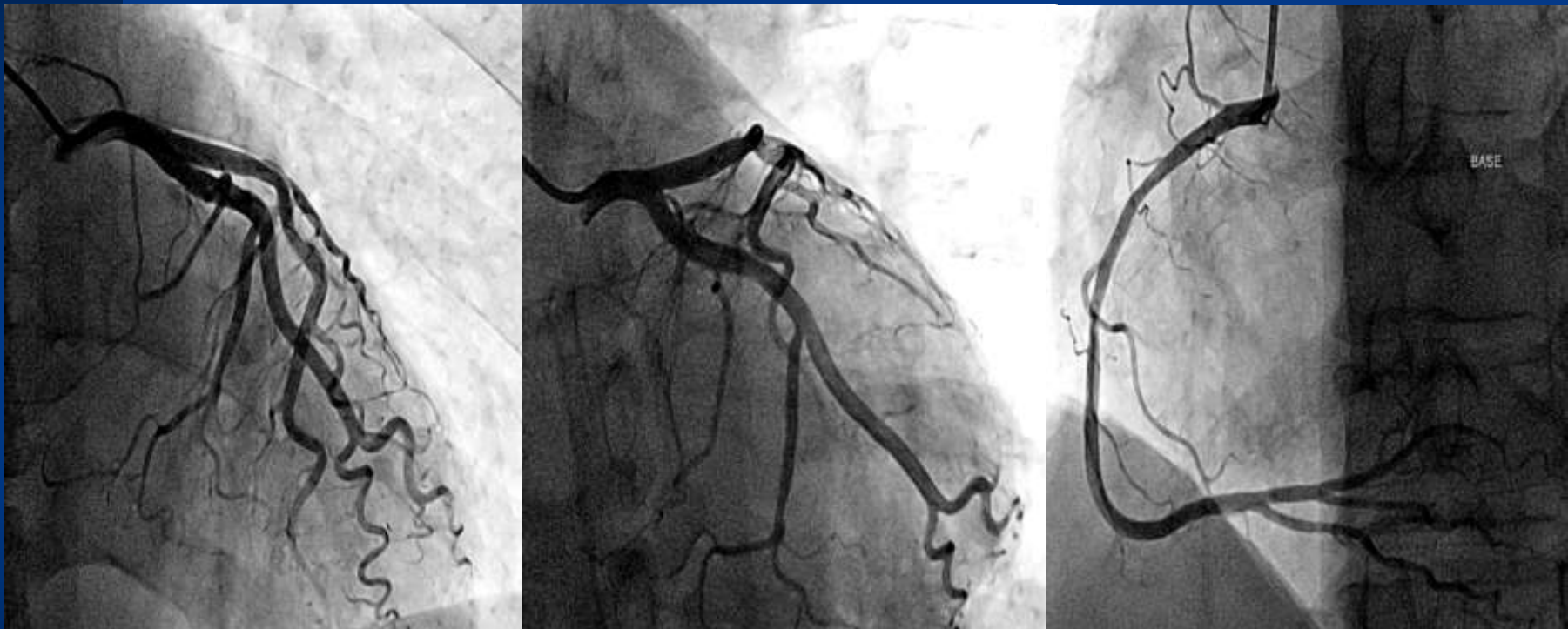
49세의 남자분으로 2-3개월 전부터 가슴이 저려오고 아픈 증상이 심해져서
정밀검사를 받기위해 외래로 내원하심

History

Past History

- DM(-) / HBP(-) / TB(-) / Hepatitis(-)
- Social History : smoking (-)
- Allergy (-)

CASE



Rt. radial artery puncture (5FR)
Spasm test -> negative

dye : visipaque 80cc

CASE

Symptom

Initial BP 120/80 pulse 72/min
→ BP 70/40 pulse 78/min

Swelling
Redness
Burning Sensation



medication

Saline 300cc push
Antihistamine 4mg
Steroid 100mg



Antihistamine 4mg
Steroid 100mg



Allergic reactions

- In humans, about 5% have some hypersensitivity reaction in minutes or delayed by hours
- Mechanism unknown but increased reactions in allergic or asthmatic people and those with heart disease
- reactions range from sneezing , urticaria , pharyngeal, cerebral or pulmonary edema, bronchospasm to fatal cardiovascular collapse in man 1/40,000 fatality rate

contrast media

- **cardiovascular effects:** vasodilation
local effects: flushing, sensation of warmth, discomfort
generalized: hypotension
- **renal effects:** diuresis due to increase in serum osmolality
acute renal failure is unusual but well recognized complication of these agents. Probably due to hypertonicity and direct chemical toxicity to kidney
predisposing factors: renal insufficiency, dehydration, congestive heart failure
- **side effects** : nausea, vomiting, fever, chills, faintness, headache, sneezing, perineal discomfort, metallic taste

Preventions to Contrast induced side effect

- History taking
- Skin allergy test
- Prevention: administering steroid and antihistamine
- Airway management, supplemental oxygen, large volume of intravenous fluids, close monitoring
- The primary treatment is injection of epinephrine
- Nebulized salbutamol for bronchospasm.

Medication to Preventions

Prednisone

- Pretreat 60mg PO daily for 24–48hr
- use Solu-Medrol 100mg IV just before the procedure

Pheniramine

- H1 blocker
- May also be given as 5–10mg IV for intraprocedural allergic reactions

Epinephrine

- for bronchospasm, cardiovascular collapse, anaphylaxis
- 0.1mg epinephrine given in small divided doses until response
- Monitor closely for tachycardia or hypertensive overshoot

CASE

Chief Complaint

mid-retrosternal pain

49세 남자 환자 특이 병력 없던 자로 substernal area 아침에 짓 누르는 양상의 진땀 동반한 심한 흉통이 30분간 지속되어 외래 방문하심

History

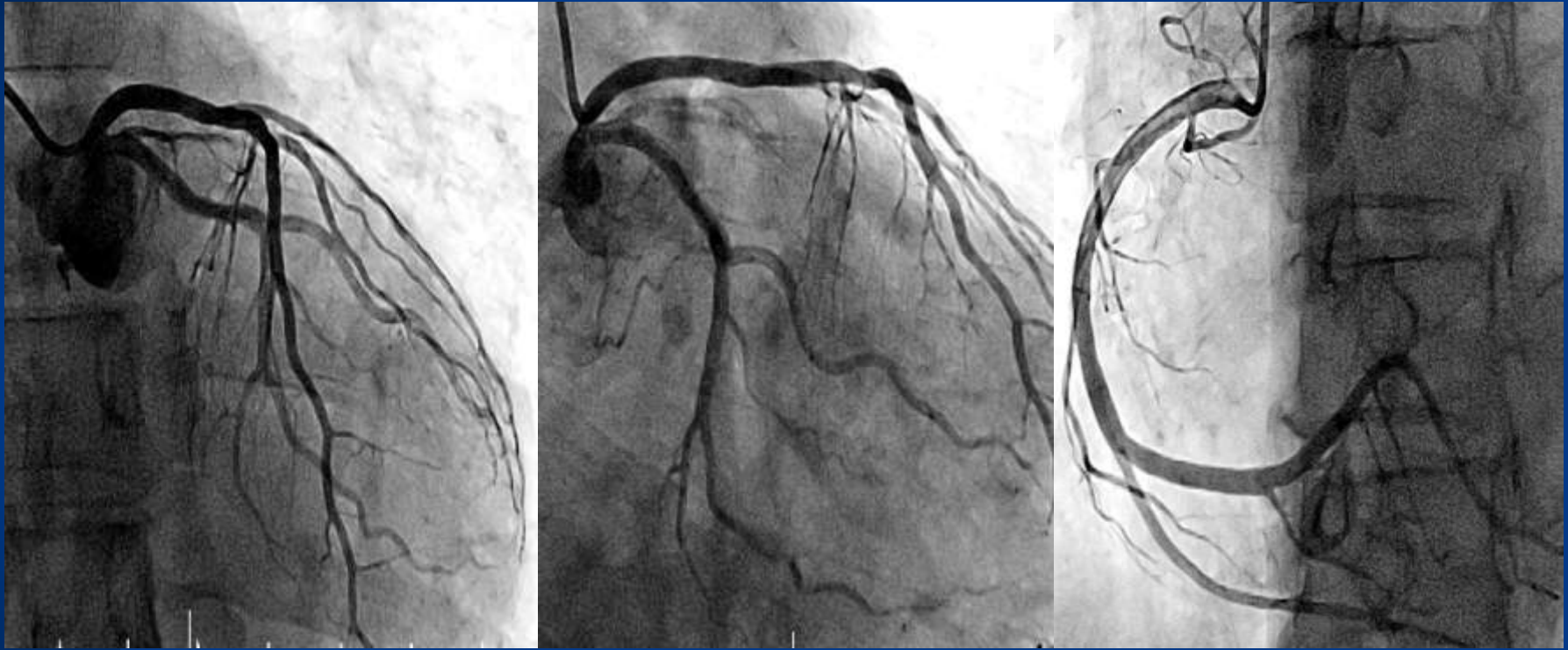
Past History

- DM(-) / HBP(+) / TB(-) / Hepatitis(-)

Social History : smoking (2p/d)

Family History : stroke(+)

CASE



Rt. radial artery puncture (5FR)

시술시간 : 30분

medication : aspirin 100mg
pregrel 600mg
heparin 3000unit

CASE

Symptom

Eye Ptosis

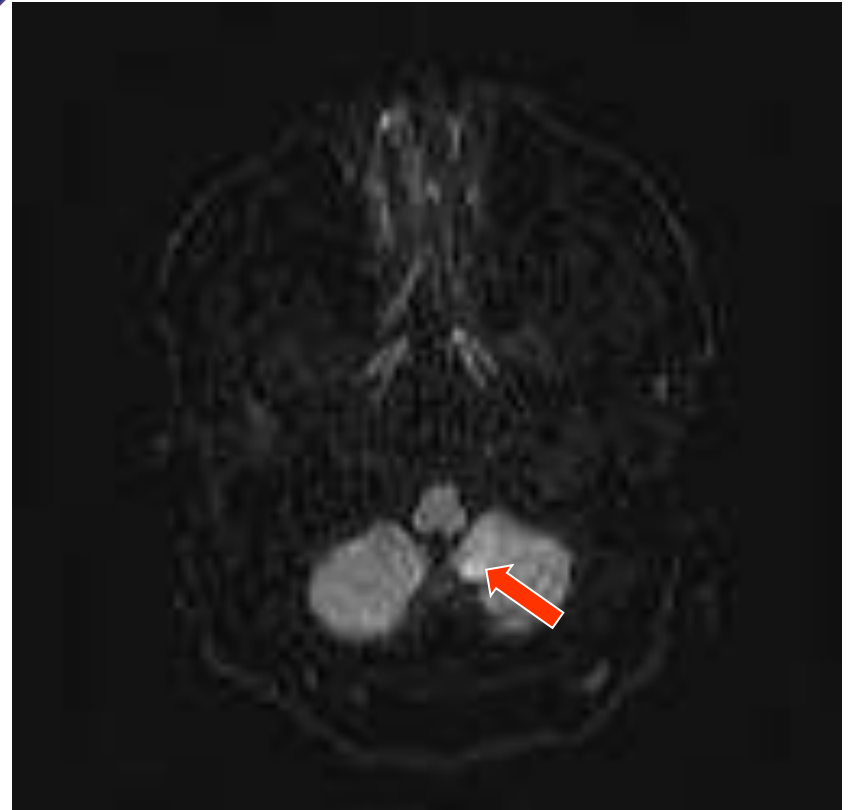
Diplopia

Gait disturbance

Disarthria



Acute cerebral infarct
에 대한 management
위해 신경과로 전과됨



Cerebrovascular infarction(stroke)

- Cardiac catheterization-related stroke has an incidence of **0.03% to 0.3%** for diagnostic procedures
Ischemic Strokes after Cardiac Catheterization. Archives of Neurology 2006.
- Asymptomatic embolic cerebral infarction underwent coronary angiography after the incidence was 0.2%
Silent Embolic Cerebral Infarction Following Diagnostic Coronary Angiography 2008.

Initial symptoms

- Hemiplegia
- Language Disorders
- Dizziness
- Impaired vision
- Diplopia
- Gait disturbance
- Dysphagia

Face



Arm



Learn these signs of stroke.

Speech

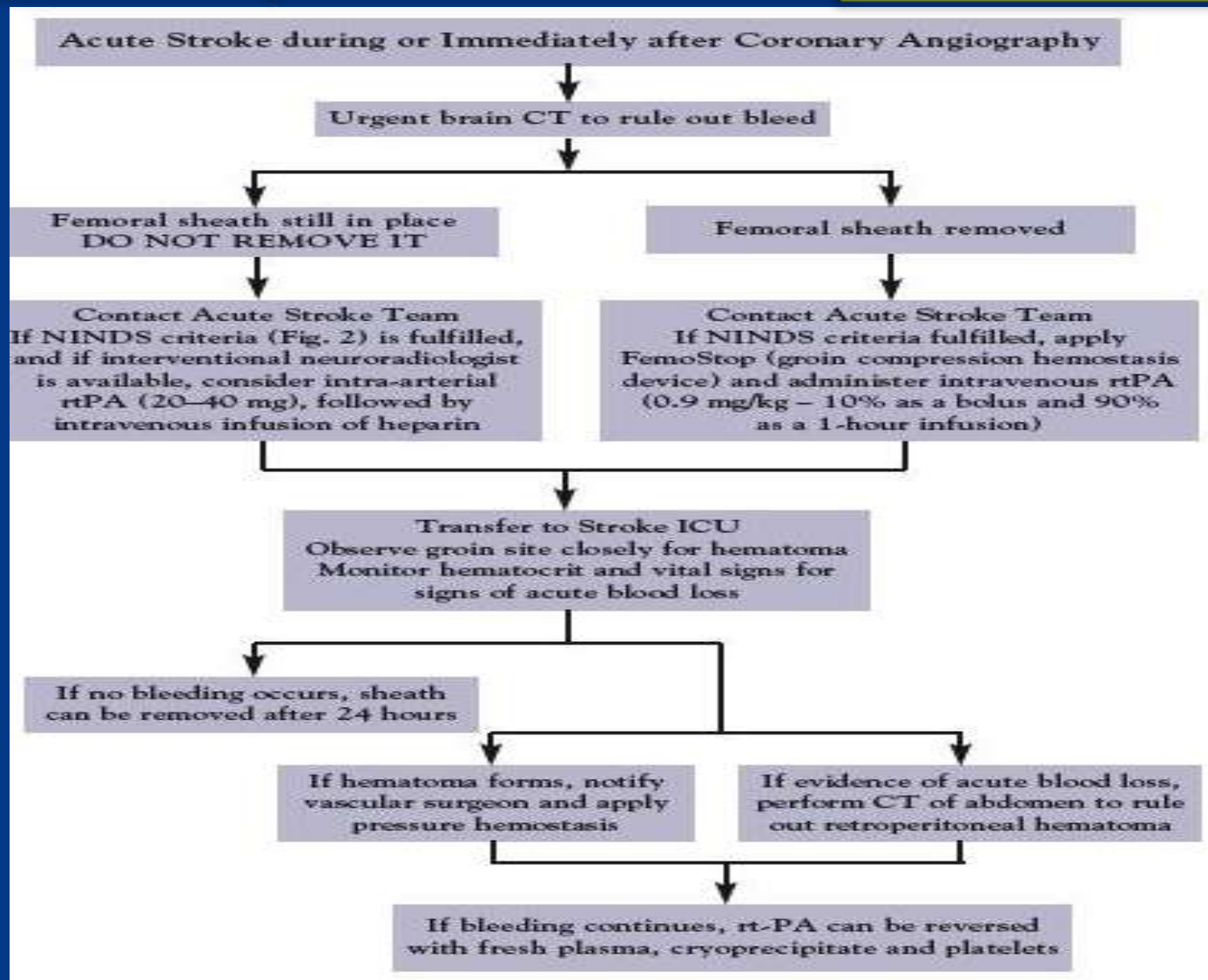


Be a hero. Save a life.

Time



Call 9-1-1



Nursing Care for Patients with Cardiovascular Disease in Day Care Center

