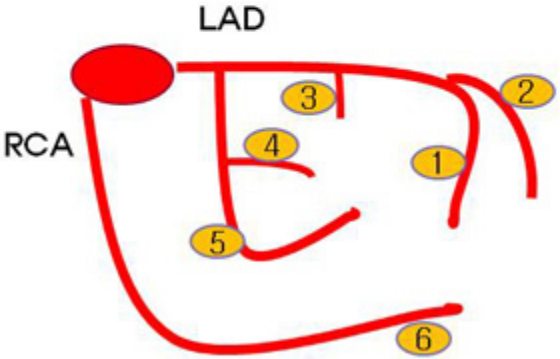
강남세브란스병원 심장혈관촬영실 간호사 김경애

Risk factors predicting in hospital mortality

1.Left ventricular ejection fraction 〈 40%
2.Creatinine〉1.5
3.Triple vessel coronary disease
4.Age〉70
5.Acute coronary syndrome

→ TIMI (thrombolysis in myocardial infarction) Risk Score

Jeopardy scoring system



High risk of shock with occulusion of target vessel

1. LVEF〈30%
2. Target vessel supply more than 50%visable myocardium
3. circulaton to both papillary muscles compromised
4. High jeopardy score〉3

→ Mortality

Initiation of reperfusion therapy with primary percutaneous coronary intervention (PCI) or fibrinolysis

2004-2007 ACC/AHA guidelines for primary PCI

Treatment Delayed is Treatment Denied

Symptom Recognition

Call to Medical System

PreHospital

ED

Cath Lab

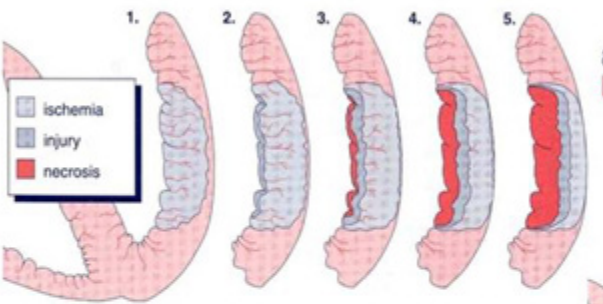
Increasing Loss of Myocytes

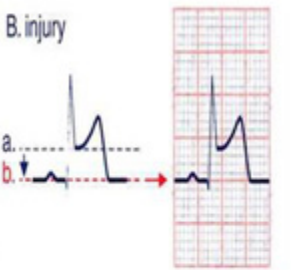
Golden Hour = first 60 min. Total ischemic time: within 120 min

Class I

1. Primary PCI should be performed as quickly as possible
   Goal: door to balloon time < 90min
2. Sx duration < 3hrs and
   (D-B time) – (D-N time) < 1hr : primary PCI
   > 1hr : fibrinolysis
3. Sx duration > 3hrs : primary PCI
4. Pt. < 75yrs who develop shock within 36hrs of MI and are suitable for revascularization that can be performed within 18hrs of shock
5. Severe CHF and/or pulmonary edema and Sx within 12hrs

Ischemic Injury in AMI





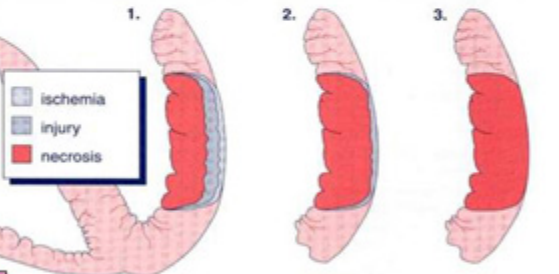
necrosis

time after onset	onset	<20-40 min	30 min	1 hr	2 hr
extent of necrosis	0%	0%	10%	30%	50%

Phase 1: Transmural MI (0-2 hr)

epicardial ischemia

90min



time after onset	3 hr	6 hr	24 hr
extent of necrosis	60%	90%	100%

Phase 2: Transmural MI (2-24 hr)

Fast tract Flow Sheet

90min

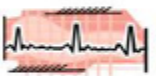
ACS 환자 진료 Fast Tract Flow Sheet (ER내원환자용)

환자 이름 _____ UN_____ 년월일 ____.____.____.

10분 이내

20분 이내

110분 이내



응급실 도착

시간: 시 분 간호사:

응급의학과 진찰

시간: 시 분 담당의:

All chest pain
30세 이상 epigastric pain

EKG판독

시간: 시 분 담당의:

ST elevation or
New onset LBBB

심장내과 협진 의뢰

시간: 시 분 담당의:

심장내과 진료 시작

시간: 시 분 담당의:

심장내과 진료 Order 입력

시간: 시 분 담당의:

PTCA위해 응급실 출발

시간: 시 분

혈전용해제 투여

시간: 시 분

스텐트 삽입

시간: 시 분

The role of the coronary care nurse

"WHAT IS THE ROLE OF THE CORONARY CARE NURSE?"

-A REVIEW OF THE LITERATURE-

1. Patient assessment and management
2. Providing information and education
3. Physical care
4. Technical care
5. Developing a relationship and adapting to the patient needs

European Journal of Cardiovascular Nursing7 (2008)163-170

A Clinical care

Critical thinking?

Critical thinking is a complex mixture of knowledge, intuition, logic, common sense, and experience

Critical thinking skills improve with increasing clinical and scientific experience.
The best way for you to develop critical thinking skills is by asking questions and learning.

ASKING QUESTION ?

"What's the patient's diagnosis?"

- What are the signs and symptoms?
- What's the usual cause?
- What complications can occur?

In addition to finding the answers to diagnosis-related questions, also be sure to find out:

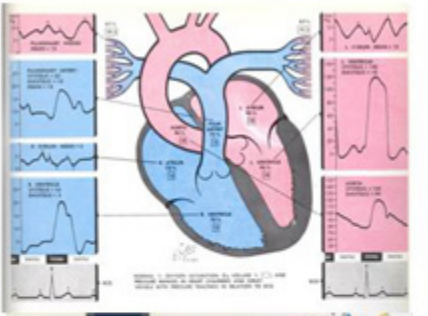
- What are the patient's physical examination findings?
- What laboratory and diagnostic tests are necessary?
- Does the patient have any risk factors? If so, are they significant? What interventions would minimize those risk factors?

High risk patient of PCI preparation

- Monitoring
  - ✓ Vital sign
  - ✓ Right heart pressure monitoring

- Patient preparation
  - ✓ Another artery & vein sheath inserted
  - ✓ Intra-aortic balloon pump/PCPS
  - ✓ Intubation

- Medication
  - ✓ GPIIb/IIIa inhibite
  - ✓ Cardiac medication
    (inotropics, vasodilator, diuretics)




Time


EMERGENCY SET


Intubation Kit


비지약품 점검 리스트
Cath2
응급약품 점검 리스트
Cath2
심장혈관촬영실
심장혈관촬영실


Adult Sedation Protocol

Case : 69세/M @@@

- hepatitis, pul Tbc 과거력 없으며, 11년 전 HTN, DM 진단 받고 P.O medication 중임.
- 08년 4월 DM nephropathy 진단 하에 본원 신장내과 F/U 중
- 09년 2월 bilateral renal A. stenosis 진단 받고 Lt renal A, stent insertion 시행
- 2010년 8월 pneumonia로 입원치료
- 2010년 9월에도 dyspnea 로 입원 치료 받았던 분으로 dry cough, DOE 지속되고 CXR상 pul. edema 소견 보여 본원 opd 경유 ER 내원 하였으며 EKG 상 Anteroseptal STEMI 소견 보여 direct PCI 시행예정으로 심장내과 입원함.

심장혈관중재술실 응급상황 발생

의사 : 환자상태 확인, 처치
방사선사 : 응급장비준비
간호사1 : 투약대기, 응급처치 준비
간호사 2 : 마취과 연락, 흉부 외과 연락

- 호흡정지,호흡곤란
- 심 정지: 맥박소실, 심음 소리, 창백, 청색증, 경련, 의식소실, 산동, EKG 변화
- 기도폐색 : 격철,구토
- 의식소실

방사선사:연락 | 기타직원:연락 | 간호사 : 연락

다른 의료진에게 큰소리로 도움요청
검사실 fellow 연락
담당 staff 연락

다른 의료진에게 큰소리로 도움요청
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담당 staff 연락

검사실fellow 연락
담당 staff연락
다른 간호사에게 도움 요청

의료진 : 환자 | 의료진 : 환자 | 간호사 : 환자

IV route확보(20G)
N/S1L loading

간호사 :응급장비준비

기도유지(head tilt,chin-lift)
인공호흡 2회 or 산소마스크Ambu bagging O2

EKG monitor/NIBP준비
Pulse Oxymeter
Intubation 준비

간호사 : 환자

방사선사:응급 장비 준비

Defibrillator
IABP(intra aortic ballon pump)

V/S 확인
응급 처치 위한 약물준비
Intubation 시행 도움

의료진 : 환자

EKG rhythm 확인
1)Pulseless VT/V-fib : Defibrillation
2)Asytole/ PEA : CPR(30 compression,2 breath)

의료진 및 직원

주변환경통제 : 검사실 내 다른환자, 보호자 정리 후
1)응급술실 시행
2) 수술실 이동
3)중환자실(CCU/ICU)이동

심장혈관중재술실 응급상황 대처 순서도

1.의식,호흡,맥박확인
2.다른 의료진에게 도움요청
3)Defibrilltor (EKG) : Rvhthm 확인후CPR 시작
4)응급시술 또는 수술 준비
5) 중환자실(CCU/ICU)또는 수술실 이동준비

* Regional Wall Motion Abnormality
LV Base
Anteroseptum Normal
Anterior Normal
Anterolateral Normal
Posterolateral Normal
Inferior Normal
Inferoseptum Normal
LV Mid
Anteroseptum Akinesi
Anterior Severe hypokines
Anterolateral Severe
Posterolateral Severe
Inferior Severe hypokines
Inferoseptum Severe
LV Apex
Anterior Akinesia without
Lateral Akinesia without
Inferior Akinesia without
Septum Akinesia without

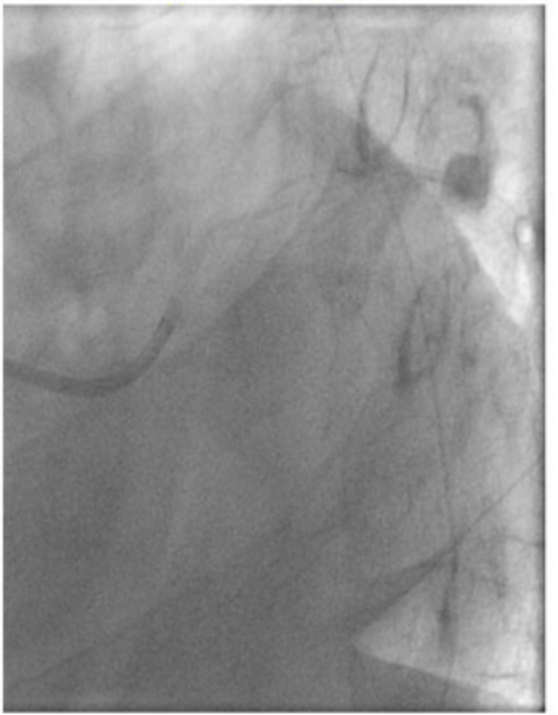
* portable echo *
-Compared with previous echo (2009-
1. RWMA as described below (mainly
change.
2. Enlarged LA (volume index= 59.3
systolic function (EF= 45->44 % by
3. Concentric remodeling of LV (LVH
4. Relaxation abnormality of LV fil
5. Degenerative VHD; insignificant
>5mmHg, AVA by C.E= 1.49->1.64 cm2)

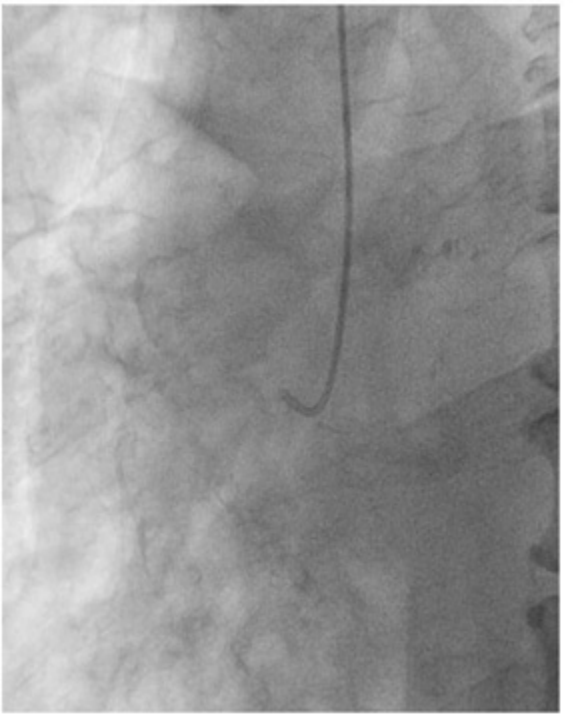
검체명	검사명		의뢰	결과	서식	참고치	R	단위	이전결과
Serum	Routine Chemistry	Calcium		8.1		8.6~9.9		mg/dL	L
		Inorganic P		4.4		2.8~4.5		mg/dL	
		Glucose		338		75~110		mg/dL	H
		BUN		37.7		7.0~21.0		mg/dL	H
		Creatinine		2.43		0.8~1.3		mg/dL	H
		Uric Acid		10.3		3.5~8.0		mg/dL	H
		Cholesterol		247		139~230		mg/dL	H
		Total Protein		7.4		6.7~8.0		g/dL	
		Albumin		3.7		3.4~5.3		g/dL	
		Alk. Phos		241		39~111		IU/L	H
		AST(GOT)		37		13~36		IU/L	H
		ALT(GPT)		35		11~46		IU/L	
		T. Bilirubin		0.3		0.2~1.3		mg/dL	
	CK			226		35~232		U/L	
	CK-MB			3.12		0~6.73		mcg/L	
	Na			139		138~146		mmol/L	
	K			5.4		3.6~4.8		mmol/L	H
	Cl			107		96~107		mmol/L	
	tCO2			17		24~32		mmol/L	L
	Troponin T			0.072		0~0.014		mcg/L	H
Plasma	BNP (B type natriuretic peptide)			1542.0		0~100		pg/mL	H

ABG(POCT)	pH	7.181
	pCO2	51.1
	pO2	71.0
	tHb	9.8
	BE-ECF	-9.2
	BE-B	-8.1
	SBC	17.7
	HCO3-	19.3
	TCO2	20.9
	O2 saturation	89.1
	O2 Content	12.3
	A	89.8
	AaDO2	18.8
	a/A	0.8
	pO2/FIO2	-
	Hct	29.0
Ca++(POCT)		0.80
	pH	7.226
	pCO2	46.8
	pO2	205.0
	BE-ECF	-8.3
	BE-B	-7.0
	HCO3-	19.6
	TCO2	21.1
	O2 saturation	99.9
	O2 Content	12.9
	tHb	8.8
	SBC	18.7
	A	94.9
	a/A	2.2
	pO2/FIO2	980.7
	Hct	27.0

약이름	시작일자
Dilatrend 12.5mg 12.5mg * 2회 PO	2010-10-26
Madipine 10mg * 2회 PO	2010-10-26
Amodipin 5mg * 2회 PO	
Amodipin 5mg * 2회 PO	
Amodipin 2.5mg * 2회 PO	2010-10-26
Sigmart 5mg * 2회 PO	2010-10-26
Vastinan MR 35mg * 2회 PO	2010-10-26
Molsiton 2mg 2mg * 1회 PO	2010-10-26
Minoxidil 2.5mg * 1회 PO	2010-10-26
Trental 400mg * 2회 PO	2010-10-26
Lasix 40mg * 2회 PO	2010-10-26
Capril 50mg 50mg * 3회 PO	2010-10-28
Amodipin 5mg * 2회 PO	2010-10-27
Lasix 40mg * 2회 PO	
Lescol-XL 80mg(서방정) 80mg * 1회 PO	2010-10-27
Capril 25mg 25mg * 1회 PO	2010-10-27
Capril 50mg 50mg * 1회 PO	2010-10-27

C-angio image



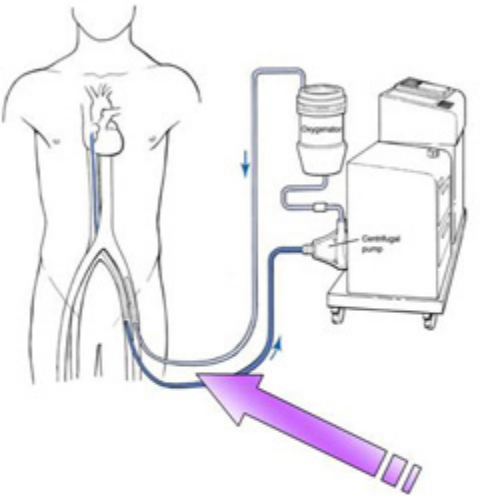


Post PCI

P-LAD:Xience 3.5 x 18
m-LAD:Xience 3.0X 28
d-LAD:Xience 3.0 X23

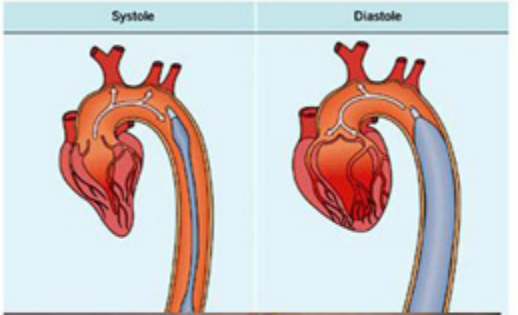
CCU care

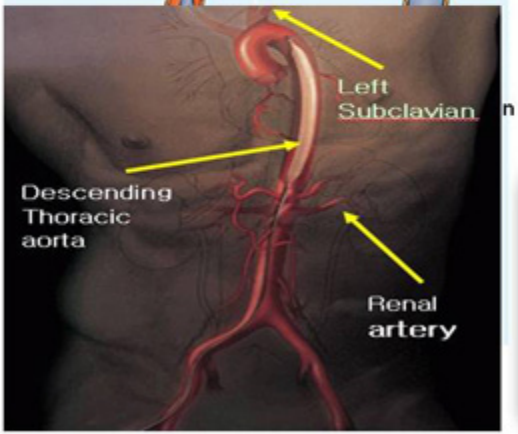
Ventilator, IABP, PCPS, CRRT

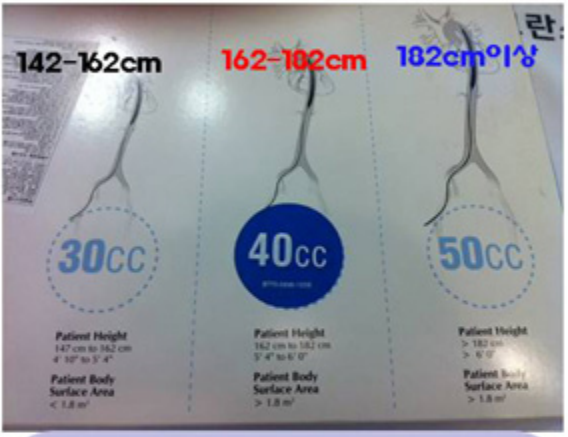


21F catheter placed in right atrium
18F cannula sheath inserted in femoral artery

Intra-aortic balloon during







➤ 단위 환산

1 French = 0.33 mm
1 inch=2.54cm
16gage=1.7mm
18gage=1.2-1.3mm
22gage=0.8-0.9 mm

Indication

Share

PCPS

- Difficulty in weaning from CPB during open heart surgery
- Inadequate cardiopulmonary support even after IABP
- Low blood pressure below 80 mmHg under full support by catecholamines
- Oliguria/anuria (<1ml/kg/h)
- Low cardiac output (<1.8 l/min/m2)
- Low PaO2 (<60mmHg)
- Uncontrollable VF/VT
- Uncontrollable metabolic acidosis

Sawa Y.J Artif Organs 2005;8:217–221

IABP

- Cardiogenic shock, uncontrolled myocardial ischemic pain, postcardiotomy low cardiac output
- High-risk (High-grade Left main CAOD/ 3VD) or failed PTCA
- Poorly controlled ventricular arrhythmias before or after operation
- Post-infarction VSD or acute MR after MI

IABP contraindication

- Severe AR
- Aortic dissection
- Severe aortoiliac or iliofemoral disease
- Abdominal or descending thoracic aneurysm

Braunwald's heart disese 7th edition

Complication

IABP

- Leg ischemia and bleeding
- Infection at the insertion site
- Aortoiliac perforation
- Aortic dissection
- Cardiac and renal Ischemia
- false aneurysm formation
- thrombus formation
- Thrombocytopenia
- Hemolysis
- Peripheral neuropathy

PCPS

- Bleeding
- Renal failure
- DIC(disseminated intravascular coagulation)
- Thrombosis
- Hemolysis
- Ischemia of the lower extremities
- Infection

Immediately after start-up

Protocol

- Chest X-ray
- Labs: CBC, ABGs, electrolyte, total protein/albumin, glucose, ACT

  - q 4hrs: Hgb, Hct, platelets, Na, K, glucose
  - q 1hr and prn, q 2hrs when stable : ACT, ABGs

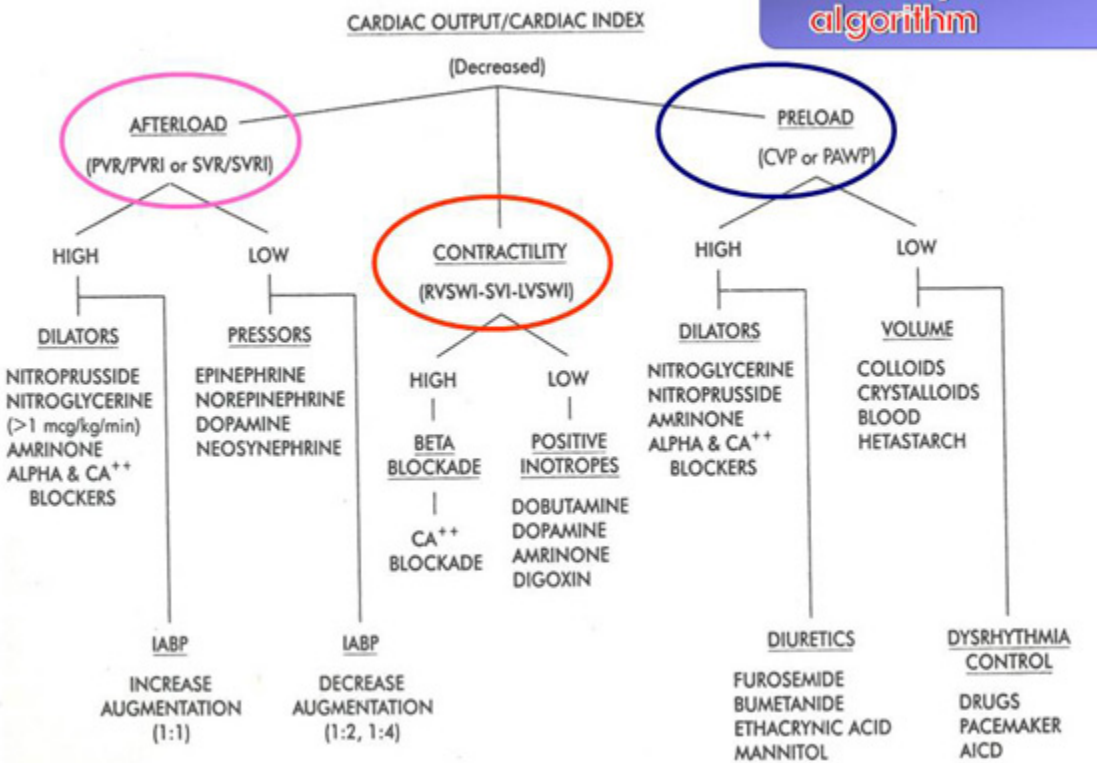
- Daily : CBC, CRP, Na, K, Cl, Ca , ion. P, Mg,
  BUN/Creatinine, total protein/ albumen, glucose,
  bilirubin, SGOT/PT, amylase,
  coagulation status including ATIII
  U/A, CXR
  Ultrasound of head (neonates)
  Microbiology: urine, sputum. Blood cultures

Medications

- Pain medication
- Antibiotics prophylaxis
- Dopamine, Dobutamine, milrinone etc.
- TPN or enteral nutrition when possible

- **Heparin**
  - Initial dose 100 IU heparin / kg iv
    maintain with 15 - 60 IU/kg/hr using infusion pump
    recommend ACT between 180 and 200 seconds
  - If ACT < 150 seconds give immediately 50IU heparin/kg bolus IV (15 – 25 IU for neonates and children)
    Then adjust infusion rate

Hemodynamic algorithm



"Someday, your dream will come true"

THANK YOU FOR YOU ATTENTION!