

MITRAL REGURGITATION

A Case Study

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June 8, 2007



**BRIGHAM AND
WOMEN'S HOSPITAL**



58 year old woman

- **Chronic MR; 1st referred in 2/01**
- **11/00 echo: preserved LVEF > 0.65**
- **LVED 4.2 cm, LVES 1.8 cm.**
- **Myxomatous bileaflet (posterior > anterior) MVP, mod-severe MR, dilated left atrium (4.3 cm)**
- **Estimated PA systolic pressures normal**

HPI

- **Occasional forceful and slightly rapid, regular heart rate**
“As if she had just climbed 3 flights”
- **Denies CP, unusual SOB, palpitations, light-headedness, syncope, or symptoms to suggest TIA/CVA**
- **Medications: amoxicillin, MVI, niacin and potassium**
- **Allergic to contrast media (“shock”)**
- **Rare ETOH, does not smoke**

Social and Family History

- **Social Hx: Independent consultant with a Doctorate in Behavioral Sciences**
- **Jazz Singer**
- **Divorced with no children**
- **No relevant family history of valvular heart disease**

Physical Exam

- **Wt. 130 lbs (5'1") BP 122/78. HR 95/reg**
- **JVD normal**
- **Lung fields clear**
- **LVI slightly enlarged, not displaced**
- **S1 normal, S2 widely split**
- **Grade III mid-late systolic murmur radiation to base and axilla. Murmur changes appropriately with valsalva maneuver. No click or diastolic filling complex.**

Exam and EKG

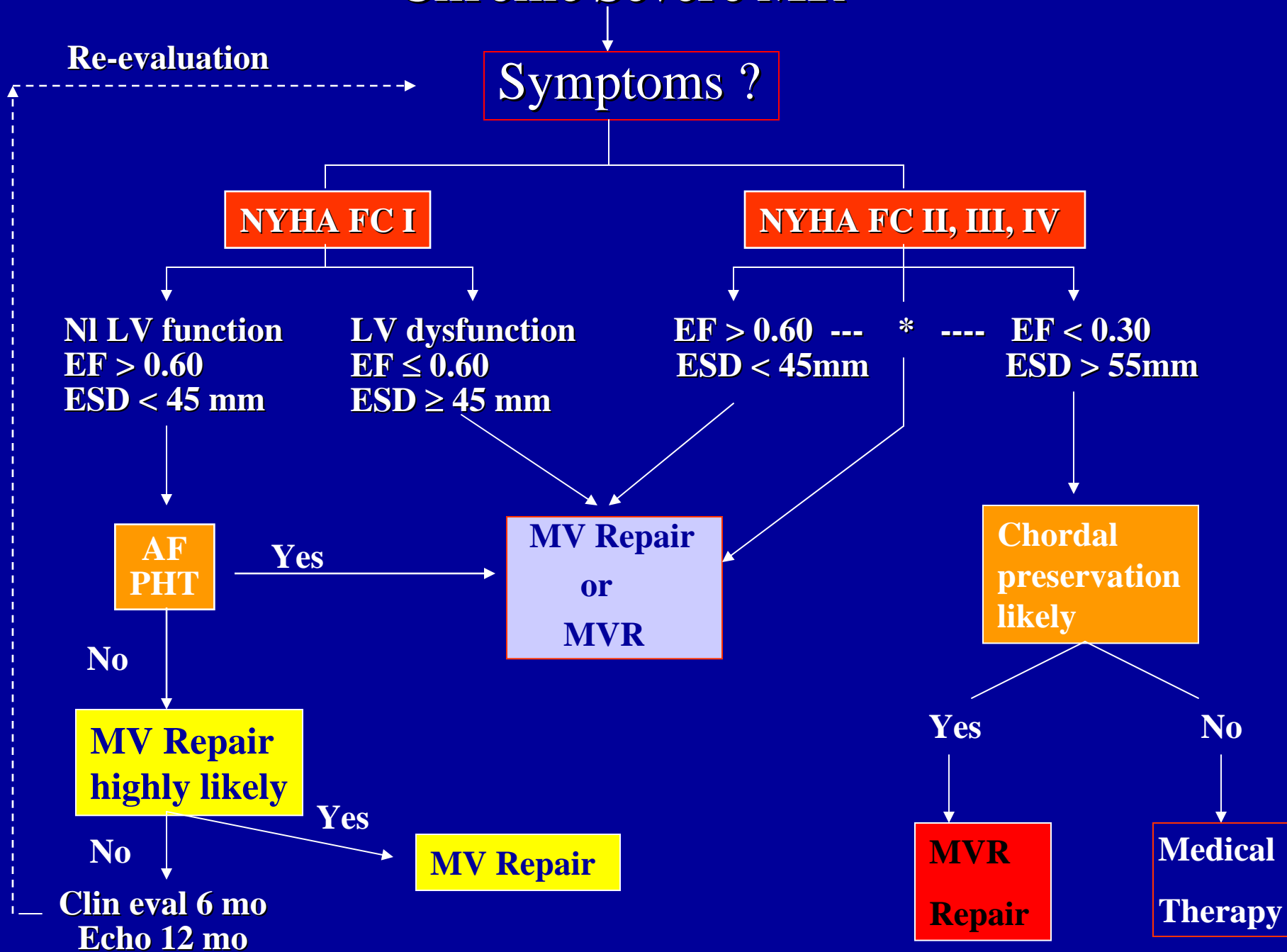
- **Abdomen exam within normal limits.**
- **Negative pedal edema, 2+ pedal pulses**

- **EKG: SR with borderline LA enlargement and minor nonspecific STT wave abnormal**

Impression and Plan

- **Chronic, severe, asymptomatic myxomatous MR, well preserved LV size & function**
- **Surgery indicated when she has symptoms +/- or progressive LV dysfunction/dilatation**
- **Serial annual Echos; Office visit q 6 months**
- **Antibiotic prophylaxis with semi-annual dentist visits**
- **No limit in physical activities except to avoid strenuous isometric exercises**

Chronic Severe MR



Serial Echos 2001-2005

7/01	8/02	1/04	10/05
EF 76%	EF 65-70%	EF 65-70%	EF 65-70%
DD 4.4 cm	DD 4.5 cm	DD 5.0 cm	DD 4.8 cm
ES 2.4 cm	ES 3.3 cm	ES 2.5 cm	ES 2.4cm
Mod-severe MR, post>ant leaflet	Mod-severe MR post>ant leaflet	Mod-severe MR Post>ant leaflet	Effective reg orifice area=70 mm²

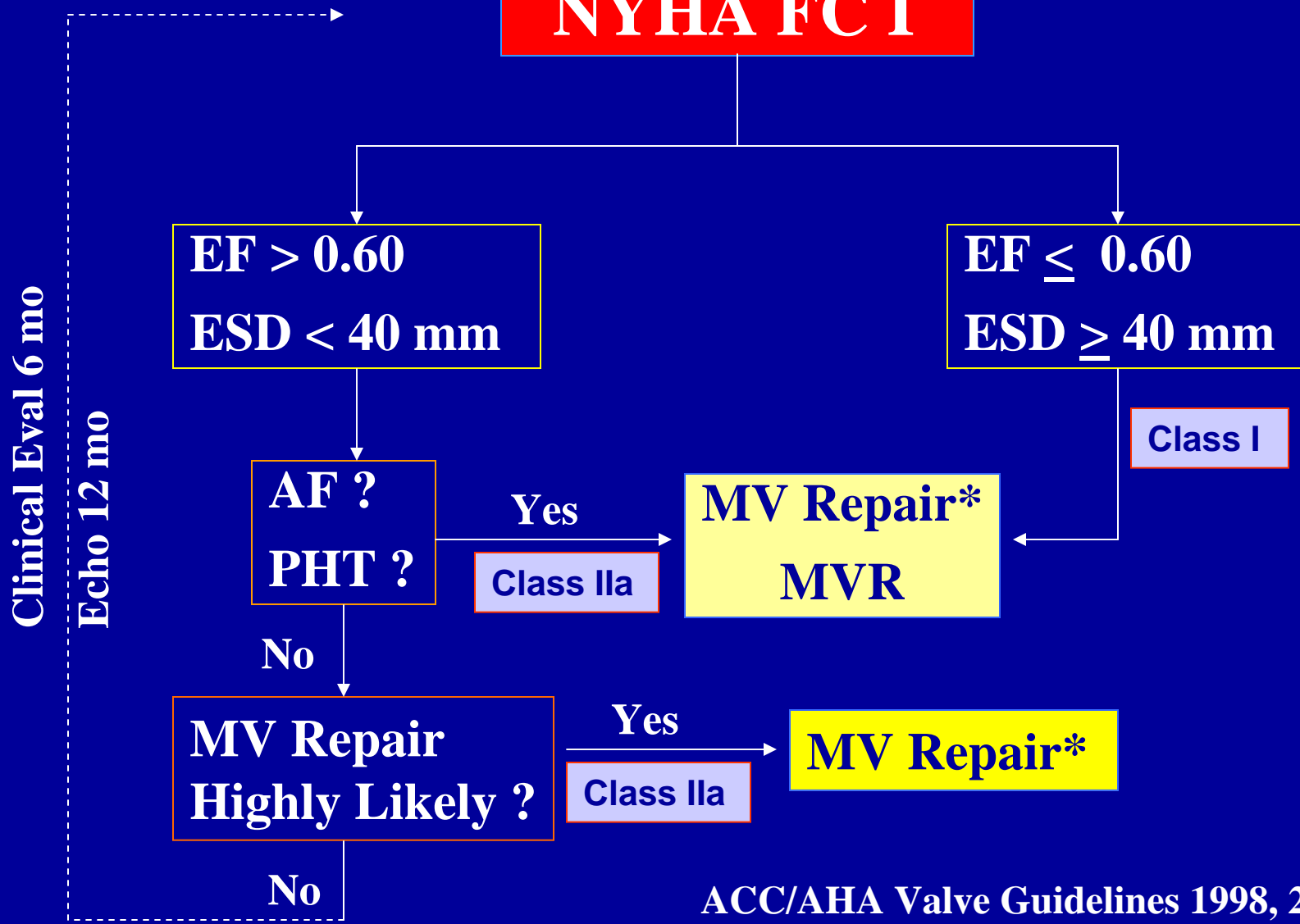
Effective regurgitant orifice = mathematical equation to quantify the amount of regurgitation

58 year old woman

- **November, 2006 - admission with rapid and regular heart rate**
- **Developed rapid AF during observation**
- **Rx IV metoprolol**
- **Warfarin anticoagulation instituted**
- **ETT-MIBI negative for inducible ischemia or arrhythmias at a high workload**
- **Discussion of implications for MV surgery**

Chronic Severe MR

NYHA FC I



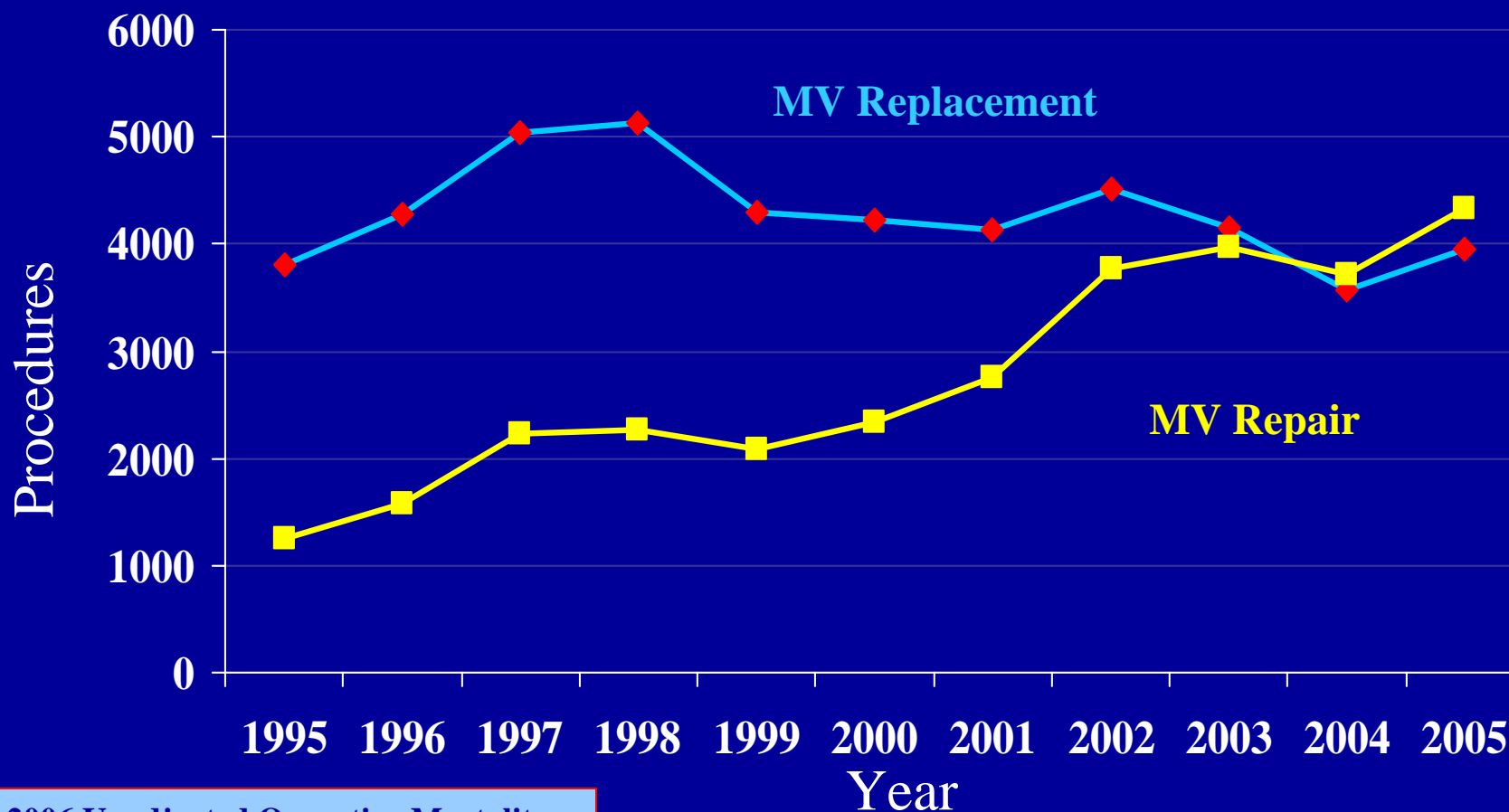
CHRONIC MR

Natural History

- “**MR begets MR**”
- **Chronic volume overload** → **LV dysfunction**
- **Ejection phase indices** >> **LV contractility**
- **Symptoms are subtle and late**

**Earlier, successful, and durable surgical repair
has frame-shifted the management paradigm !!**

ISOLATED MV SURGERY



2006 Unadjusted Operative Mortality

MVR 6%	MVR/CABG 10%
MVP 1%	MVP/CABG 7%

<http://www.sts.org/documents/pdf/STS-ExecutiveSummarySpring2006.pdf>

Pre-op Evaluation

- **Patient coming to terms, seeks 2nd opinion**
- **Preparation for surgery**
 - **Dental clearance**
 - **Autologous blood donation**
 - **PATC**
 - **Office visit with plastic surgeon**
 - **Office visit anesthesia re concerns voice**
 - **Mind-Body techniques**

Cardiac MRI/MRA

- **Mod dilated LV EF 64%, normal RV**
- **No perfusion defects**
- *No evidence of CAD by MRA*
- **Bileaflet MVP more prominent prolapse of post mitral leaflet. Severe MR anteromedially-directed regurgitant jet.**
- **Regurgitant fraction estimated at 55%.**
- **Regurgitant volume is 60cc/beat**

Mitral Valve repair with ring annuloplasty Maze procedure with Left Atrial appendage ligation

- **ICU: Intubated 6.5 hours**
- **Post op sinus rhythm**
- **Continuous insulin infusion (Portland protocol)**
- **Stryker Pain pump (Bupivacaine) weaned POD #3**
- **Pain rx toradol-Relaxation tapes**
- **Out of bed POD #1**
- **Discharged POD#5**

Discharge Planning

- **VNA referral**
- **Anticoagulation to be monitored by PCP-Goal INR 2-3**
- **Keep incisions clean and dry**
- **Monitor and report increased temperature and weight, peripheral edema or SOB**
- **Appointment with Cardiologist and Cardiac Surgeon**

First Post Operative Visit

- **POD #30 Mitral Valve repair with Maze Procedure**
- **Walking 20 minutes on treadmill daily**
- **No signs of infection / Wound well-healed**
- **Weight back to preoperative level 136 lbs.**
- **Heart rate 83 and *regular*, BP 107/69**
- **No audible murmur**
- **Lung fields clear**
- **Venous pressure not elevated**
- **No peripheral edema or pulse deficit**

58 year old woman

- She has had an excellent, early results from MVR with Maze.
- Plan full 6 months of warfarin anticoagulation. If she continues in sinus rhythm, consider stopping warfarin and replace with low dose ASA.
- Continue meds: warfarin, metoprolol tartate 50 mg bid, lisinopril 10 mg daily and atorvastatin 10 mg daily.

Pre-op echo/post-op echo

10/25/06	3/30/07
EF 65-70%	EF 55-60%
DD 4.03 cm	DD 4.3 cm
DS 2.94 cm	DS 3.0 cm
Mod-severe MR	No sign MR
Jet ant directed	S/p repair with annuloplasty ring

Summary

- ✓ Right Timing
- ✓ Right Surgery
- ✓ High volume Institution
- ✓ Experienced Surgeon
- ✓ Optimal Recovery



Endocarditis Prophylaxis

Cardiac Conditions

- ✓ Prosthetic cardiac valve
 - ✓ Previous IE
 - ✓ Congenital heart disease
 - ✓ Cardiac transplantation recipients who develop cardiac valvulopathy
-
- Dental procedure
 - Procedure on respiratory tract or infected skin.

Thank You

Surgery for MR Due to MVP

Re-operation

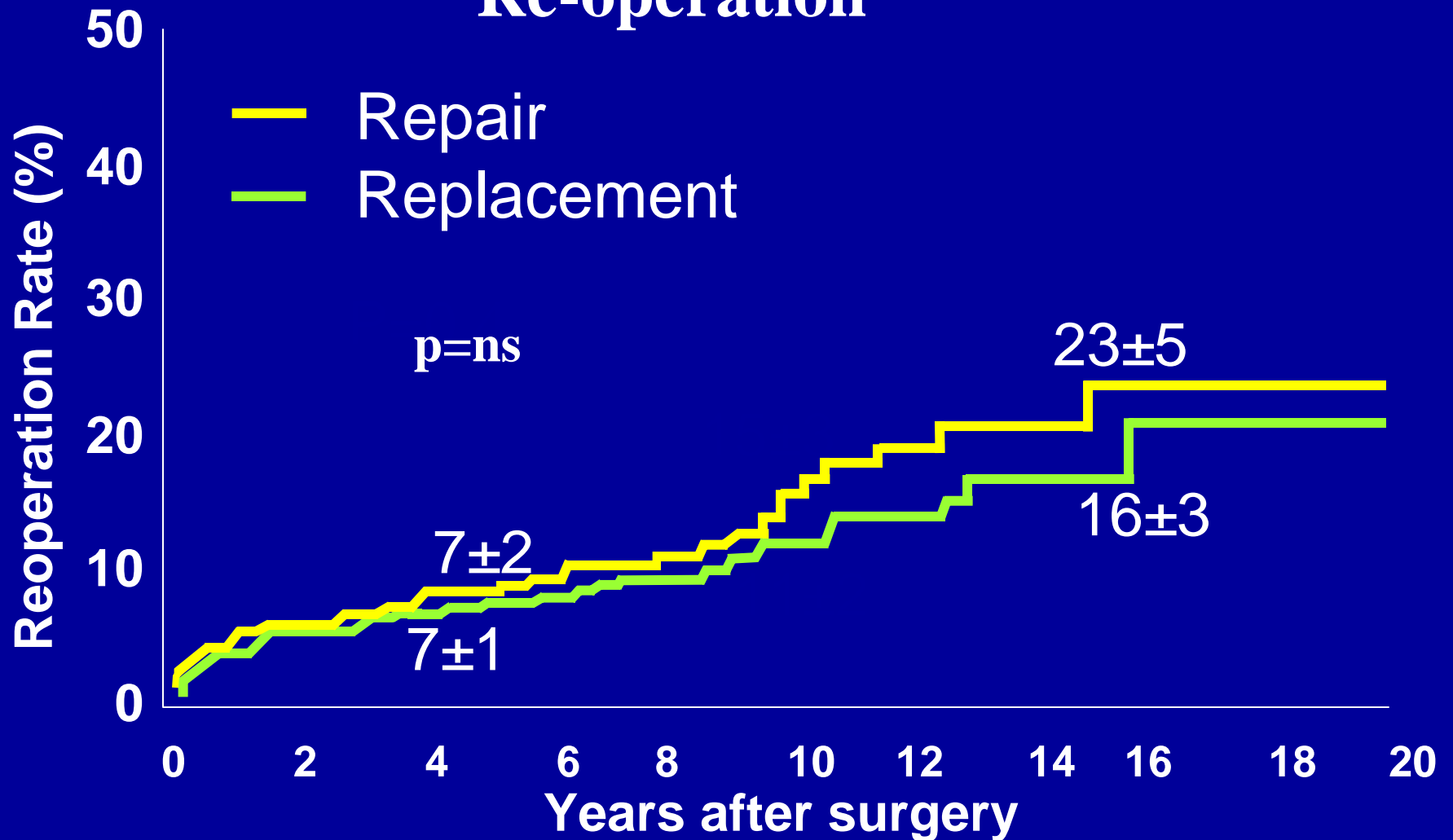


TABLE 3. Cardiac Conditions Associated With the Highest Risk of Adverse Outcome From Endocarditis for Which Prophylaxis With Dental Procedures Is Recommended

Prosthetic cardiac valve

Previous IE

Congenital heart disease (CHD)*

Unrepaired cyanotic CHD, including palliative shunts and conduits

Completely repaired congenital heart defect with prosthetic material or device, whether placed by surgery or by catheter intervention, during the first 6 months after the procedure†

Repaired CHD with residual defects at the site or adjacent to the site of a prosthetic patch or prosthetic device (which inhibit endothelialization)

Cardiac transplantation recipients who develop cardiac valvulopathy

*Except for the conditions listed above, antibiotic prophylaxis is no longer recommended for any other form of CHD.

†Prophylaxis is recommended because endothelialization of prosthetic material occurs within 6 months after the procedure.

TABLE 5. Regimens for a Dental Procedure

Situation	Agent	Regimen: Single Dose 30 to 60 min Before Procedure	
		Adults	Children
Oral	Amoxicillin	2 g	50 mg/kg
Unable to take oral medication	Ampicillin	2 g IM or IV	50 mg/kg IM or IV
	OR Cefazolin or ceftriaxone	1 g IM or IV	50 mg/kg IM or IV
Allergic to penicillins or ampicillin—oral	Cephalexin*†	2 g	50 mg/kg
	OR Clindamycin	600 mg	20 mg/kg
	OR Azithromycin or clarithromycin	500 mg	15 mg/kg
Allergic to penicillins or ampicillin and unable to take oral medication	Cefazolin or ceftriaxone†	1 g IM or IV	50 mg/kg IM or IV
	OR Clindamycin	600 mg IM or IV	20 mg/kg IM or IV

IM indicates intramuscular; IV, intravenous.

*Or other first- or second-generation oral cephalosporin in equivalent adult or pediatric dosage.

†Cephalosporins should not be used in an individual with a history of anaphylaxis, angioedema, or urticaria with penicillins or ampicillin.

TABLE 6. Summary of Major Changes in Updated Document

We concluded that bacteremia resulting from daily activities is much more likely to cause IE than bacteremia associated with a dental procedure.

We concluded that only an extremely small number of cases of IE might be prevented by antibiotic prophylaxis even if prophylaxis is 100% effective.

Antibiotic prophylaxis is not recommended based solely on an increased lifetime risk of acquisition of IE.

Limit recommendations for IE prophylaxis only to those conditions listed in Table 3.

Antibiotic prophylaxis is no longer recommended for any other form of CHD, except for the conditions listed in Table 3.

Antibiotic prophylaxis is recommended for all dental procedures that involve manipulation of gingival tissues or periapical region of teeth or perforation of oral mucosa only for patients with underlying cardiac conditions associated with the highest risk of adverse outcome from IE (Table 3).

Antibiotic prophylaxis is recommended for procedures on respiratory tract or infected skin, skin structures, or musculoskeletal tissue only for patients with underlying cardiac conditions associated with the highest risk of adverse outcome from IE (Table 3).

Antibiotic prophylaxis solely to prevent IE is not recommended for GU or GI tract procedures.

The writing group reaffirms the procedures noted in the 1997 prophylaxis guidelines for which endocarditis prophylaxis is not recommended and extends this to other common procedures, including ear and body piercing, tattooing, and vaginal delivery and hysterectomy.

CHRONIC MR

RISK STRATIFICATION

Predictors of Outcome

- Age
- Symptoms : NYHA
- Severity of MR
- **LV function (EF, ESD); PA pressure**
- AF
- CAD
- Co-morbidities (DM, CKD, other)

Applying classification of recommendations and level of evidence

		"SIZE OF TREATMENT EFFECT"			
		Class I	Class IIa	Class IIb	Class III
		Benefit >>> Risk	Benefit >> Risk <i>Additional studies with focused objectives needed</i>	Benefit ≥ Risk <i>Additional studies with broad objectives needed; Additional registry data would be helpful</i>	Risk ≥ Benefit <i>No additional studies needed</i>
		Procedure/Treatment SHOULD be performed/administered	IT IS REASONABLE to perform procedure/administer treatment	Procedure/Treatment MAY BE CONSIDERED	Procedure/Treatment should NOT be performed/administered SINCE IT IS NOT HELPFUL AND MAY BE HARMFUL
"ESTIMATE OF CERTAINTY (PRECISION) OF TREATMENT EFFECT"	Level A <i>Multiple (3-5) population risk strata evaluated*</i> <i>General consistency of direction and magnitude of effect</i>	<ul style="list-style-type: none"> Recommendation that procedure or treatment is useful/effective Sufficient evidence from multiple randomized trials or meta-analyses 	<ul style="list-style-type: none"> Recommendation in favor of treatment or procedure being useful/effective Some conflicting evidence from multiple randomized trials or meta-analyses 	<ul style="list-style-type: none"> Recommendation's usefulness/efficacy less well established Greater conflicting evidence from multiple randomized trials or meta-analyses 	<ul style="list-style-type: none"> Recommendation that procedure or treatment not useful/effective and may be harmful Sufficient evidence from multiple randomized trials or meta-analyses
	Level B <i>Limited (2-3) population risk strata evaluated*</i>	<ul style="list-style-type: none"> Recommendation that procedure or treatment is useful/effective Limited evidence from single randomized trial or non-randomized studies 	<ul style="list-style-type: none"> Recommendation in favor of treatment or procedure being useful/ effective Some conflicting evidence from single randomized trial or non-randomized studies 	<ul style="list-style-type: none"> Recommendation's usefulness/efficacy less well established Greater conflicting evidence from single randomized trial or non-randomized studies 	<ul style="list-style-type: none"> Recommendation that procedure or treatment not useful/effective and may be harmful Limited evidence from single randomized trial or non-randomized studies
	Level C <i>Very limited (1-2) population risk strata evaluated*</i>	<ul style="list-style-type: none"> Recommendation that procedure or treatment is useful/effective Only expert opinion, case studies, or standard-of-care 	<ul style="list-style-type: none"> Recommendation in favor of treatment or procedure being useful/ effective Only diverging expert opinion, case studies, or standard-of-care 	<ul style="list-style-type: none"> Recommendation's usefulness/efficacy less well established Only diverging expert opinion, case studies, or standard-of-care 	<ul style="list-style-type: none"> Recommendation that procedure or treatment not useful/effective and may be harmful Only expert opinion, case studies, or standard-of-care
Suggested phrases for writing recommendations †		should is recommended is indicated is useful/effective/beneficial	is reasonable can be useful/effective/ beneficial is probably recommended or indicated	may/might be considered may/might be reasonable usefulness/effectiveness is unknown /unclear/uncertain or not well established	is not recommended is not indicated should not is not useful/effective/beneficial may be harmful

Bonow, R. O. et al. J Am Coll Cardiol 2006;48:e1-e148

Layer Closure of chest , 40 cm

- **Deep fascia had been closed**
- **Closed deep layers with interrupted 2-0 vicryl and then ran a 4-0 Vicryl suture along the length of 40 cm and covered this Demabond**

MVrepair with ring annuloplasty

Maze procedure with LA app lig

- **Myxomatous degenerated valve w/ruptured chords in P2**
- **Limited resection of P2**
- **Modified leaflet advancement through that point**
- **Modified sliding annuloplasty**
- **38-mm Cosgrove -Edwards ring**
- **Edge to edge repair, figure 8, A2-P2**