

# **Routine Monitoring of Cataract Outcome**

## Outcome of cataract surgery is:

- the change in functional disability as a result of cataract operation
- usually expressed as visual acuity

## Outcome depends on:

- skills and knowledge of eye surgeon
- surgical technique used
- surgical facilities and environment
- post-operative care
- optical correction provided
- patient-related risk factors, like ocular co-morbidity (glaucoma, age-related macula degeneration, etc.)

## Also . . . .

- Good outcome will motivate other patients to come forward for surgery
- Poor outcome will deter other cases
- In most surveys fear of losing sight was major reason not to come for surgery
- When causes of poor outcome are known, it will be possible to address these causes and thereby improve results of cataract surgery
- Improved outcome will lead to more patients coming forward for surgery

# Barriers to cataract surgery:

Barrier	Madurai ( '86)	Karnataka ( '95)	South India ( '98)
Fear of losing sight			12
Fear of surgery	17	12	6
Cannot afford	17	8	14
No company	25	21	
Not yet mature	2	24	
No time	14	5	15
No need	24	6	16
No information		6	
Other barriers		18	37

# Best corrected vision after 1 year in clinical trials:

## LAHAN

## ARAVIND

Visual Acuity	ICCE + specs	ICCE + AC-IOL	ICCE + specs	ECCE + PC-IOL
6/6 - 6/18	93.2	89.9	95.5	96.6
< 6/18 - 6/60	4.6	7.5	2.9	1.1
< 6/60	2.2	2.6	1.6	2.3
n=	914	906	1401	1474
follow-up	91%		85%	

# Average visual outcome in population based studies:

Place	Year	No. of eyes	% eyes with VA<6/60	
			With available correction	With 'best' correction
Nepal	1998	220	30.5	10.9
Shunyi, China	1998	116	44.8	-
Doumen, China	1999	152	52.6	21.0
Karnataka, India	1995	2401	26.4	-
Ahmedabad, India	1997	776	24.0	-
Hyderabad, India	1999	131	21.4	16.8
Punjab, India	2000	428	23.1	-
Turkmenistan	2000	258	34.5	-

# Outcome in population based surveys

Please note variation in:

- Post-operative period (weeks to decades)
- Quality of surgical facilities (basic to excellent)
- Experience and skills of surgeons (couchers)
- Supply and replacement of spectacles
- Initial good outcome may go down due to other eye disorders, reducing vision with age
- Outcome data from surveys may not do justice to recent advancements in IOL surgery, but may very well reflect what the public sees and what determines their expectations and trust to regain sight after surgery



# WHO guidelines on Visual Outcome of Cataract Surgery

	<b>Post-operative acuity</b>	<b>Available correction</b>	<b>Best correction</b>
<b>Good</b>	$\geq 6/18$	$>80\%$	$>90\%$
<b>Borderline</b>	$< 6/18 - 6/60$	$<15\%$	$<5\%$
<b>Poor</b>	$< 6/60$	$<5\%$	$<5\%$

## Additional guidelines:

- Operations with IOL 90% or more (depending on local facilities)
- Surgical complications less than 10%
  - Capsula rupture less than 5%
  - Vitreous loss less than 5%
- Trends over time improving or static within recommended limits.

## Important aspects:

- Assess outcome at discharge and 4+ weeks
- Motivate all patients to come for review (incentives like spectacles, post-op drugs, no queue, may help)
- Use for age-related cataract only
- Assess cause of poor outcome
- Use manual or computer system for standardized analysis
- Is outcome representative for all operated patients if not all operated persons return for follow-up?

# Purpose of monitoring cataract outcome:

- Encourage eye surgeons to monitor their own results over time
- Identify causes of poor outcome
  - Selection
  - Surgery
  - Spectacles
  - Sequelae
- Address causes to improve future outcome

# Monitoring of cataract outcome should NOT be used to compare surgeons and institutions

- Differences in indications for surgery
- Differences in target population
- Differences in facilities (microscope)
- Differences in surgical skills
- Competition may lead to false reporting
- Refusal to operate at risk patients
- Less operations done by residents

# Cataract Surgery Record

CATARACT SURGERY RECORD							
<b>A. PATIENT Name:</b> _____			Hosp. Reg. No:		[ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]		
Address (optional): _____			Serial No:		[ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]		
Sex: Male <input type="radio"/> (1) Female <input type="radio"/> (2)			Age: [ ][ ] years				
<b>B. PRE-OPERATIVE EXAMINATION</b>						<b>Category of Visual Acuity (Snellen 6 m)</b>	
Visual Acuity:		Right eye		Left eye			
Presenting VA:		VA: [ ][ ]	VA: [ ][ ]	VA: [ ][ ]	VA: [ ][ ]	1 6/6 9 1/60	
'Best' or pinhole VA:		VA: [ ][ ]	VA: [ ][ ]	VA: [ ][ ]	VA: [ ][ ]	2 6/9 10 PL+	
Lens Examination:		Clear lens <input type="radio"/> (1) <input type="radio"/> (1)				3 6/12 11 NPL	
Opacify, not ready for operation		<input type="radio"/> (2) <input type="radio"/> (2)				4 6/18 12 Cannot examine,	
Operable cataract		<input type="radio"/> (3) <input type="radio"/> (3)				5 6/24 believed <6/60	
Inoperable cataract		<input type="radio"/> (4) <input type="radio"/> (4)				6 6/36 13 Cannot examine,	
Aphakia		<input type="radio"/> (5) <input type="radio"/> (5)				7 6/60 believed >6/60	
Pseudophakia		<input type="radio"/> (6) <input type="radio"/> (6)				8 3/60	
Cannot examine		<input type="radio"/> (7) <input type="radio"/> (7)					
Other ocular pathology in the eye to be operated, likely to affect outcome:						<b>CLINICAL DATA:</b>	
Corneal scar		<input type="radio"/> (1)					
Old iritis		<input type="radio"/> (2)					
Retinal disease (DM, AMD, etc)		<input type="radio"/> (3)					
Glaucoma		<input type="radio"/> (4)					
Other & specify		<input type="radio"/> (5)					
<b>Optional:</b> Eye to be operated: Right: <input type="radio"/> (1) Left: <input type="radio"/> (2)							
Refraction: sp [ ][ ] cyl [ ][ ] axis [ ][ ]			Biometry: K1 [ ][ ] K2 [ ][ ]				
Targeted post-op. spherical equiv. sp [ ][ ]			Axial length: [ ][ ]				
<b>C. SURGERY</b>							
Date of operation: [ ][ ] / [ ][ ] / [ ][ ]			Hospital / Camp ID		[ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]		
Place of operation: Base hospital <input type="radio"/> (1) Other hospital <input type="radio"/> (2) Out of hospital <input type="radio"/> (3)			Surgeon ID		[ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]		
Type of surgery: ICCE <input type="radio"/> (1) ECCE <input type="radio"/> (2) Manual Phaco <input type="radio"/> (3) Phaco <input type="radio"/> (4)			IOL: PC IOL <input type="radio"/> (1) AC IOL <input type="radio"/> (2) No IOL <input type="radio"/> (3)		Training: Ophthalmologist <input type="radio"/> (1) Resident / trainee <input type="radio"/> (2) Cataract surgeon <input type="radio"/> (3)		
Operative complications in operated eye:			None <input type="radio"/> (1)		Wound leak <input type="radio"/> (6)		
Capsule rupture without vitr. loss <input type="radio"/> (2)			Vitreous loss <input type="radio"/> (3)		Striate keratopathy <input type="radio"/> (7)		
Zonular dehiscence <input type="radio"/> (4)			Retained lens matter <input type="radio"/> (5)		Endophthalmitis <input type="radio"/> (8)		
Others <input type="radio"/> (9)							
<b>Optional:</b> Section: corneal <input type="radio"/> (1) limbal <input type="radio"/> (2) tunnel <input type="radio"/> (3)							
Capsulotomy: linear <input type="radio"/> (1) ccc <input type="radio"/> (2) can opener <input type="radio"/> (3) other <input type="radio"/> (4)		Type IOL: _____		Suture: no suture <input type="radio"/> (1) continuous <input type="radio"/> (2) interrupted <input type="radio"/> (3)			
IOL power: [ ][ ]		No. of sutures: [ ][ ]					
<b>D. VISUAL ACUITY OF OPERATED EYE POST-OP.</b> Cause of presenting vision <6/60 (Key 8, 9, 10, 11, 12)							
Follow-up visits		Presenting VA		'Best' VA		Select. Surg. Specs Sequel	
At discharge, [ ][ ] days post-op.		[ ][ ]		[ ][ ]		<input type="radio"/> (1) <input type="radio"/> (2) <input type="radio"/> (3)	
1-3 wk po: [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]		[ ][ ]		[ ][ ]		<input type="radio"/> (1) <input type="radio"/> (2) <input type="radio"/> (3) <input type="radio"/> (4)	
4-11 wk po: [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]		[ ][ ]		[ ][ ]		<input type="radio"/> (1) <input type="radio"/> (2) <input type="radio"/> (3) <input type="radio"/> (4)	
12+ wk po: [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]		[ ][ ]		[ ][ ]		<input type="radio"/> (1) <input type="radio"/> (2) <input type="radio"/> (3) <input type="radio"/> (4)	
						<b>Optional: post-op refraction:</b>	
sp [ ][ ] cyl [ ][ ] axis [ ][ ]			sp [ ][ ] cyl [ ][ ] axis [ ][ ]				

## CATARACT SURGERY RECORD

**A. PATIENT** Name: \_\_\_\_\_ Hosp. Reg. No: 

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Address (optional): \_\_\_\_\_ Serial No: 

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Sex: Male  (1) Female  (2) Age: 

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 years

Patient name: write name

Address: write full address (optional)

Hosp. Reg.: write hospital registration number

Serial No.: do NOT write

Sex: mark "Male" or "Female"

Age: write age (20-99)

## B. PRE-OPERATIVE EXAMINATION

		Right eye		Left eye	
Visual Acuity:	Presenting	VA:	<input type="text"/>	VA:	<input type="text"/>
	'Best' or pinhole	VA:	<input type="text"/>	VA:	<input type="text"/>

Lens Examination:	Clear lens	<input type="radio"/> (1)	<input type="radio"/> (1)
	Opacity, not ready for operation	<input type="radio"/> (2)	<input type="radio"/> (2)
	Operable cataract	<input type="radio"/> (3)	<input type="radio"/> (3)
	Inoperable cataract	<input type="radio"/> (4)	<input type="radio"/> (4)
	Aphakia	<input type="radio"/> (5)	<input type="radio"/> (5)
	Pseudophakia	<input type="radio"/> (6)	<input type="radio"/> (6)
	Cannot examine	<input type="radio"/> (7)	<input type="radio"/> (7)

### Other ocular pathology in the eye to be operated, likely to

affect outcome:	Corneal scar	<input type="radio"/> (1)
	Old iritis	<input type="radio"/> (2)
	Retinal disease (DM, AMD, etc.)	<input type="radio"/> (3)
	Glaucoma	<input type="radio"/> (4)
	Other & specify	<input type="radio"/> (5)

### Category of Visual Acuity (Snellen 6 m)

1	6/6	9	1/60
2	6/9	10	PL+
3	6/12	11	NPL
4	6/18	12	Cannot examine, believed <6/60
5	6/24	13	Cannot examine, believed >6/60
6	6/36		
7	6/60		
8	3/60		

### CLINICAL DATA:

Optional:	Eye to be operated:	Right: <input type="radio"/> (1)	Left: <input type="radio"/> (2)		
	Refraction:	sp <input type="text"/>	cyl <input type="text"/>	axis <input type="text"/>	Biometry: K1 <input type="text"/>
	Targeted post-op. spherical equiv.	sp <input type="text"/>			K2 <input type="text"/>
				Axial length:	<input type="text"/>

Presenting VA: with available correction (use key)

'Best' VA: with best correction / pinhole (key)

Lens examination: mark one option

Other pathology: mark one option



<b>C. SURGERY</b>		d d / m m / y y		Hospital / Camp ID _____	
Date of operation:		<input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/>		Surgeon ID _____	
Place of operation:		Base hospital <input type="radio"/> (1) Other hospital <input type="radio"/> (2) Out of hospital <input type="radio"/> (3)		Training:	
				Ophthalmologist <input type="radio"/> (1) Resident / trainee <input type="radio"/> (2) Cataract surgeon <input type="radio"/> (3)	
Type of surgery:		IOL:		Operative complications in operated eye:	
ICCE <input type="radio"/> (1) ECCE <input type="radio"/> (2) Manual Phaco <input type="radio"/> (3) Phaco <input type="radio"/> (4)		PC IOL <input type="radio"/> (1) AC IOL <input type="radio"/> (2) No IOL <input type="radio"/> (3)		None <input type="radio"/> (1) Capsule rupture without vitr. loss <input type="radio"/> (2) Vitreous loss <input type="radio"/> (3) Zonular dehiscence <input type="radio"/> (4) Retained lens matter <input type="radio"/> (5)	
				Wound leak <input type="radio"/> (6) Striate keratopathy <input type="radio"/> (7) Endophthalmitis <input type="radio"/> (8) Others <input type="radio"/> (9)	
Optional:	Section:	Capsulotomy:	linear <input type="radio"/> (1)	Type IOL:	Suture:
	corneal <input type="radio"/> (1)		ccc <input type="radio"/> (2)	_____	no suture <input type="radio"/> (1)
	limbal <input type="radio"/> (2)		can opener <input type="radio"/> (3)	IOL power: <input type="text"/>	continuous <input type="radio"/> (2)
	tunnel <input type="radio"/> (3)		other <input type="radio"/> (4)		interrupted <input type="radio"/> (3)
					No. of sutures: <input type="text"/>

Manual phaco: mini 'nuc'  
 Hospital/camp: write name  
 Surgeon: write name  
 Complications: mark only one

D. VISUAL ACUITY OF OPERATED EYE POST-OP.						Cause of presenting vision <6/60 (Key 8, 9, 10, 11, 12)				
Follow-up visits	Presenting VA	'Best' VA	Select.	Surg.	Specs	Sequel				
At discharge, <input type="text"/> days post-op.	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="radio"/> (1)	<input type="radio"/> (2)	<input type="radio"/> (3)					
1-3 wk po: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="radio"/> (1)	<input type="radio"/> (2)	<input type="radio"/> (3)	<input type="radio"/> (4)	<b>Optional: post-op refraction:</b>			
4-11 wk po: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="radio"/> (1)	<input type="radio"/> (2)	<input type="radio"/> (3)	<input type="radio"/> (4)	sp <input type="text"/>	cyl <input type="text"/>	axis <input type="text"/>	
12+ wk po: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="radio"/> (1)	<input type="radio"/> (2)	<input type="radio"/> (3)	<input type="radio"/> (4)	sp <input type="text"/>	cyl <input type="text"/>	axis <input type="text"/>	

If presenting VA <6/60: mark one main cause

1<sup>st</sup> visit:

1-3 weeks post-op.

2<sup>nd</sup> visit:

4-11 weeks post-op.

3<sup>rd</sup> visit:

12 or more weeks post-op.

To be completed at discharge

To be completed at follow-up visits

CATARACT SURGERY RECORD									
<b>A. PATIENT</b> Name: _____				Hosp. Reg. No: <input type="text"/>		Serial No: <input type="text"/>			
Address (optional): _____				Sex: Male <input type="radio"/> (1) Female <input type="radio"/> (2)		Age: <input type="text"/> years			
<b>B. PRE-OPERATIVE EXAMINATION</b>						<b>Category of Visual Acuity (Snellen 6 m)</b>			
Visual Acuity:		Right eye		Left eye		1	6/6	9	1/60
Presenting VA:		VA: <input type="text"/>		VA: <input type="text"/>		2	6/9	10	PL+
'Best' or pinhole VA:		VA: <input type="text"/>		VA: <input type="text"/>		3	6/12	11	NPL
Lens Examination:		Clear lens <input type="radio"/> (1)		<input type="radio"/> (1)		4	6/18	12	Cannot examine, believed <6/60
Opacity, not ready for operation		<input type="radio"/> (2)		<input type="radio"/> (2)		5	6/24	13	Cannot examine, believed >6/60
Operable cataract		<input type="radio"/> (3)		<input type="radio"/> (3)		6	6/36		
Inoperable cataract		<input type="radio"/> (4)		<input type="radio"/> (4)		7	6/60		
Aphakia		<input type="radio"/> (5)		<input type="radio"/> (5)		8	3/60		
Pseudophakia		<input type="radio"/> (6)		<input type="radio"/> (6)					
Cannot examine		<input type="radio"/> (7)		<input type="radio"/> (7)					
Other ocular pathology in the eye to be operated, likely to affect outcome:						<b>CLINICAL DATA:</b>			
Corneal scar		<input type="radio"/> (1)							
Old iritis		<input type="radio"/> (2)							
Retinal disease (DM, AMD, etc)		<input type="radio"/> (3)							
Glaucoma		<input type="radio"/> (4)							
Other & specify		<input type="radio"/> (5)							
<b>Optional:</b> Eye to be operated: Right: <input type="radio"/> (1) Left: <input type="radio"/> (2)				Refraction: sp <input type="text"/> cyl <input type="text"/> axis <input type="text"/>		Biometry: K1 <input type="text"/> K2 <input type="text"/>		Axial length: <input type="text"/>	
Targeted post-op. spherical equiv. sp <input type="text"/>									
<b>C. SURGERY</b>						Hospital / Camp ID _____			
Date of operation:		d d / m m / y y		Surgeon ID _____					
Place of operation:		Base hospital <input type="radio"/> (1)		Training:		Ophthalmologist <input type="radio"/> (1)			
Other hospital <input type="radio"/> (2)		Out of hospital <input type="radio"/> (3)		Resident / trainee <input type="radio"/> (2)		Cataract surgeon <input type="radio"/> (3)			
Type of surgery:		IOL:		Operative complications in operated eye:					
ICCE <input type="radio"/> (1)		PC IOL <input type="radio"/> (1)		None <input type="radio"/> (1)		Wound leak <input type="radio"/> (6)			
ECCE <input type="radio"/> (2)		AC IOL <input type="radio"/> (2)		Capsule rupture without vitr. loss <input type="radio"/> (2)		Striate keratopathy <input type="radio"/> (7)			
Manual Phaco <input type="radio"/> (3)		No IOL <input type="radio"/> (3)		Vitreous loss <input type="radio"/> (3)		Endophthalmitis <input type="radio"/> (8)			
Phaco <input type="radio"/> (4)				Zonular dehiscence <input type="radio"/> (4)		Others <input type="radio"/> (9)			
				Retained lens matter <input type="radio"/> (5)					
<b>Optional:</b> Section:		Capsulotomy:		linear <input type="radio"/> (1)		Type IOL: _____		Suture: no suture <input type="radio"/> (1)	
corneal <input type="radio"/> (1)		occ <input type="radio"/> (2)		can opener <input type="radio"/> (3)		IOL power: <input type="text"/>		continuous <input type="radio"/> (2)	
limbal <input type="radio"/> (2)		other <input type="radio"/> (4)						interrupted <input type="radio"/> (3)	
tunnel <input type="radio"/> (3)								No. of sutures: <input type="text"/>	
<b>D. VISUAL ACUITY OF OPERATED EYE POST-OP.</b>						Cause of presenting vision <6/60 (Key 8, 9, 10, 11, 12)			
Follow-up visits		Presenting VA		'Best' VA		Select.		Surg. Specs Sequel	
At discharge		<input type="text"/>		<input type="text"/>		<input type="radio"/> (1) <input type="radio"/> (2) <input type="radio"/> (3)			
1-3 wk po:		<input type="text"/>		<input type="text"/>		<input type="radio"/> (1) <input type="radio"/> (2) <input type="radio"/> (3) <input type="radio"/> (4)		Optional: post-op refraction:	
4-11 wk po:		<input type="text"/>		<input type="text"/>		<input type="radio"/> (1) <input type="radio"/> (2) <input type="radio"/> (3) <input type="radio"/> (4)		sp <input type="text"/> cyl <input type="text"/> axis <input type="text"/>	
12+ wk po:		<input type="text"/>		<input type="text"/>		<input type="radio"/> (1) <input type="radio"/> (2) <input type="radio"/> (3) <input type="radio"/> (4)		sp <input type="text"/> cyl <input type="text"/> axis <input type="text"/>	