DELTA® STATIONERY | INDEX

My Self Radhika

Community Ophthalmology.....

S. No.	Date	Title	Pg. No.	Remarks
1.		Vit A deficiency.	1	
2.		Onchocerchiasis	4	
3.		Childhood Blindness	7	
4.		Blindness Control	12	
5.		Vision 2020.	19	
6.		Eye Camp.	26	
7.		NPCB	32	
8.		Neuroprotection.	36.	
9.		Ocular Stem Cells	38.	

Vit A def (Nutritional Blindness)

DELTA Pg No.

global view → Blindness from malnutrition in African countries

Etiopatho

Prolonged Vit A lack + gen Malnutrition

↓

After ppt illness ← measles, RTI (↑ Metab abs)
Severe diarrhoea

Stores in body Vit A status α intake of retinal & carotenoids ⊆ Vit A activity i.e Provit A.
α Liver stores

Neonates gets Im mother in utero & Breast milk
Liver stores last for 6 mths

Epidemiology Mostly underprivileged

Measles, Diarrhoea, PEM

Severe keratomalacia — 3yrs of age
6mths – 3yrs of age

Rich ppl → Liver Cirrhosis
Elderly pt ⊆ poor diet.

Manifestation

- Primary Sign
  - X1a → Conjunctival Xerosis
  - X1b → Bitot's spot
  - X2 → Corneal Xerosis
  - X3 → Corneal ulceration
  - X4 → Keratomalacia.
- Secondary Signs
  - XN → Night blindness
  - XF → Xerophthalmic fundus
  - XS → Xerophthalmic Scar

Bitot's Spot

Keratomalacia

Dull, Insensitive Cornea
hazy, yellow infiltrates form
whole tissue necrosis → melting away

Absence of inflamm. Rx.
Opt by Acute systemic illness — Measles, pneumonia or severe diarrhoea
↓
do not close their lids, Cornea is exposed
2° bacterial infection
Complicate the picture.

Rx

As Ophthalmic emergency.
Child is hospitalized

3 doses given 0, 1, 14 d

At time of Dx | After 24 hrs | After 2 week

Retinyl palmitate is given orally

age	wt	dose
<6 mth		50,000 IU
6-12 Mth	<8 Kg	1,00,000 IU
>12 mth	>8 Kg	2,00,000 IU

Mode of administration → Oral oil based preparation

Persistent vomitting
Profuse diarrhoea
↓
Water miscible Vit A (Retinyl palmitate) i.m. injection
1/2 dosage as substitute.

Prevention → green leafy veg
Orange coloured fruits → Carrots, papaya, mango
Supplements → Cod liver
Halibut liver oil
→ Vit A fortification of foods.
Vit A orally every 6mth

To children → (Not on Breastfeed) < 1yr → 50,000 IU stat
1-6yrs ≤ 8kg → 2lac. IU
1st dose & MMR vaccine

To mothers
At time of birth & Breastfeeding

Sign.

Control of Vit A NB

- Health Education
- Dietary advice
- Immunization
- Sanitation
- Better hygiene

Vit A →

- As part of prevention
- Severely Malnutritioned child
- Keratomalacia

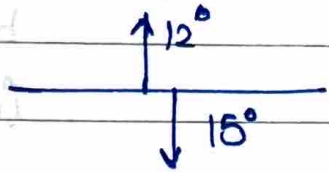
As part of prevention / Severely Malnutritioned child → Single dose

Keratomalacia → 3 doses 0, 1, 14d

Onchocerciasis

DELTA Pg No. 4
Date / /

Global Picture →



In Africa.

South & Central America.

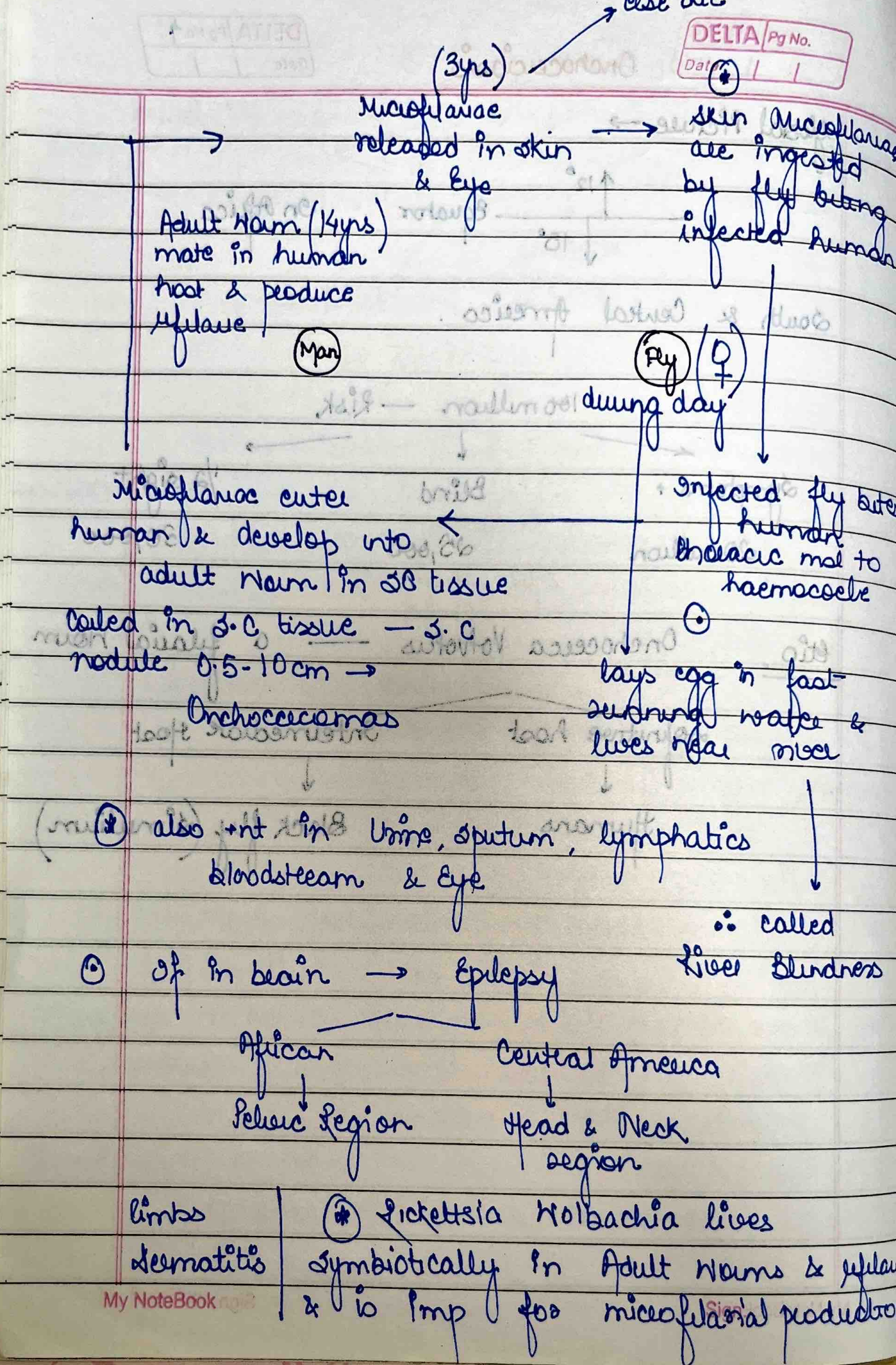
100 million — Risk

- Symptoms + : 20 million
- Blind : 25,000
- ½ sight : 30,000

Etio Onchocerca Volvulus — a filarial Worm

- Definitive host → Humans
- Intermediate Host → Black fly (Simulium)

DELTA Pg No. Date / /



My NoteBook

Damage

Scaring ← Cicatrization → Atrophy

Blindness

Corneal scaring ← glaucoma ← Retinopathy → Optic atrophy

Epidemiology

Hyperendemic area — 60% infected
else 5-10% of whole population
>40yrs → 30% ↓

West Africa

Savannah Region = Prevalence
Forest area = Blindness Rate ↓

Acquired early, VL late.
after 15yrs of age

due to diff in distance frm breeding site.
type of clothing
Diff in species of Simulium fly
L Ochraceum

DELTA Pg No. Date / /

S. Ochraceum — Bite human
tend to bite in upper parts

Venezuela — S. metallicum

Diagnosis characteristic skin & eye changes
Slit lamp Exam
└ detect ufilariae in AC

Skin Snip Exam — To look for ufilariae escaping for excised skin placed in saline & water under uscope

Histo exam → of exised skin nodule for adult worm

DNA probe
Tear / Urine Ag detection — Ocho dipstick

Tx & Control drugs — Suramin
DEC
Ivermectin (Mectizan

My NoteBook Sign.

Wt (kg)	dose
15-24	3mg
25-44	6mg (1 tab)
45-64	9mg
>65	12mg

6mg single dose
↓
repeated every 6-12 mth acc to wt. of pt
150 mg/kg

Prevention

Control of Vector
Treatment

1° level
↓
Village health Worker

2° & 3°
↓
Training
Supervision.
Mx of complicated cases

Blindness — Irreversible

% death of uveitis — Anterior glaucoma
ON cancer

% Topical & systemic steroids.

C/F — Leopard skin
Onchocercomata.
Severe LN pathy
Ant Uveitis

keratitis
Chorioretinitis — Sparing macula

Rx — Ivermectin for microfilaria
× for Adult
Suramin I.V
Ivermectin can cause toxic encephalopathy in pt ⊆ Loa Loa infection

1) Moxidectin — superior to Ivermectin
2) Doxycycline 100mg/day for 6wk to target Wolbachia

Childhood Blindness

DELTA Pg No. 7
Date / /

Blind – 1·5 million Low Vision 3-4*

↓

1 million — Asia

Blind yrs → Cataract – 125 million

↓

Childhood Blind – 75 million

Visually handicapped — 5 million

Each yr blind — 5,00,000 children

50% die in childhood.

Etio

Anatomical Etio.

↓ Whole globe
- Nano-ophthalmos
- Ano.
- Phthisis Bulbi
- Atrophic

↓ Cornea
- Scar
- Ant Staphyloma.
- Dystrophy

↓ Lens

↓ Uvea
- Aniridia
- Coloboma
- Uveitis

↓ Retina

↓ Glaucom
- Buphthalm

DELTA Pg No.
Date / /

Lens	Retina	ON	Others
Cataract	ROP	OA	Cortical blindness
Dislocation	R. dystrophy	Hypoplasia	Amblyopia
Aphakia	RD		
	Vasculitis		

Etio

Hereditary	Intrauterine	Perinatal	Childhood
Chromosomal disorders	Cong. rubella.	O. Neonatorum	Vit A def
Single gene defect	foetal alcohol Syndrome	ROP	Measles
		Birth trauma	Trauma

Sign.

Avoidable Causes of Childhood Blindness

Region	Preventable disease (a)	Treatable dis. (b)	Avoidable (a+b)
West Africa	39 %	31 %	70 %
Thailand	33 %	26 %	59 %
Chile	18 %	36 %	54 %
South India	37 %	10 %	47 %
	Vit A def Hereditary dis. Ophthalmia N	Cataract Glaucoma Others.	

My NoteBook
Sign.
DELTA Pg No. 8

Prevention

1° care level | 2° level | 3° level

1° care level

Approach ∝ prevalent diseases
focus & priorities vary region to region
Principles

- Identification of population at risk.
- Implementing pre-emptive measure

Vit A def.

Rx doses — where prevalence is high

Ophthalmia Neonatorum

cleansing the eye after birth
1% Tetracycline Oint

Measles

Immunization against Measles
Vaccination Rubella <1 yr.
L Pepubertal girls 10-12 yrs

My NoteBook Sign.

~~Treatment~~

2° level

Mx of Eye injuries
Corneal Ulcer
Refractive error correction

↓

Appropriate referral to 3° centre

3° level

Screening & Tx of ROP

↓

Mx of Cataract
Corneal Scars
Glaucoma
Strabismus
Complicated cases of Eye trauma

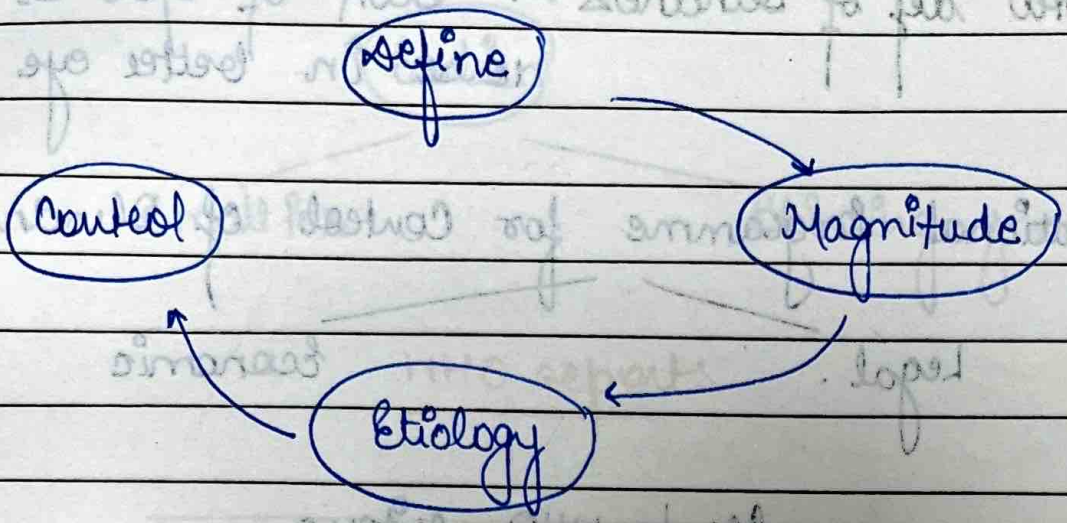
Screening

disorders with silent manifestations

Birth (Torch. Exam)	Pre-School	School
Buphthalmos	Squint	Refractive error.
Cataract	Amblyopia	
O. Neonatorum	Rb.	
Nystagmus	Vit A def	
Squint		
ROP		

Blindness

DELTA | Pg No. 12
Date / /



What is Blindness?

WHO grades of defective vision

Category		BCVA in better eye
0	Normal	6/6 - 6/18
1	Visual impairment	6/18 - 6/60
2	Severe Visual impairment	<6/60 - 3/60
3	Blind ~~Legal~~ ? Social	<3/60 - 1/60 5-10°
4	Blind ? Legal	<1/60 - PL+ve <5°
5	Blind	No PL.
9.	Undetermined & Specified.	

Economic.

My NoteBook

Sign.

WHO def of Blindness → BCVA of 3/60 or worse in better eye

National Programme for Control of Blindness

Legal. → Economic

Acc to WHO criteria in World

Blind → 45 million

Visually disabled → 135 million

90% in developing countries

Developed → Developing

Avoidable Blindness

because of Resources

Causes of Blindness

Earlier

- Small Pox
- Blinding gonorrhoea.

WHO reports

Global.

Cataract	43%
Glaucoma	15%
Diabetic Retinopathy	8%

Localized / focal

Trachoma	11%
Vit A def	6%
Onchocerciasis	1%

Geographic distribution

Developing

0.5 - 1%

Blind

Cataract
Glaucoma
Trachoma
Vit A def
Onchocerciasis
DR
ARMs

Developed

0.2%

Refractive errors
Glaucoma
Cataract
DR
ARMs

Sign.

Blindness Control

DELTA Pg No. 14
Date / /

∝ Bio
Prevalence of disease

Based on

Strategy
Disease
Services
Community

Strategy

- 1° prevention
- 2° → Prevention of visual loss once disease has occured.
- 3° → Restoration of sight to blind person

Disease

- Services for Cataract Sx
- Provision for Vit A supplementation
- Control of Trachoma
- Schoolchild screen → RE
- Distribution of Ivermectin

My NoteBook

Service Oriented

- 1° Care → Community level
- 2° Care → General Medical Dr / Non Ophthalmologists
- 3° Care → at Referral Centre → Training all spls

Community

Population at Risk.

? is good

- PHC
  - Vit def
  - Trachoma
  - Trauma.
- Community based
  - Cataract
  - Glaucoma
  - Blinding Trachoma

Rehab
Assessment
Assistance.

PHC include shd →

- Good Quality of food, H_2O, clean environment
- Control & prevention of epidemics
- Control of Endemic disease
- Education
- Improved level of ♀ & O→ health.

Eye care services

- Adequate referral system
- Regular refresher training courses

Target group →
- School teachers
- Village leaders
- Community Councils
- Local administrative authority
- Individual family

Education →
- Aware of preventable dis
- Available avenue to seek curative measures
- Encouraged to participate in blindness control
- Gen info
  - Imp of hygiene
  - Sanitation
  - Proper Nutrition
  - Eye protection

My NoteBook

DELTA Pg No.
Date / /

Primary Care Worker

- Disease to be recognised & Rx at PHCN
  - Acute Conj
  - ① Neonatorum
  - Trachoma.
    - Stye
    - Sub Conj Hmg
    - Vit A def.
    - Corneal Ulc
- Recognise & refer to 2° & 3° level
  - Injury to eyeball
  - Lid laceration
  - Exteopion
  - ↓
  - Referred
    - No heal 3-5d
    - Referred for Rx
      - ↓
      - Painful Red eye
    - Vision worse than 6/18
- Preventive activities
  - ↓
  - Midwives
    - Clean eyelid
    - 1% Tetracycline
  - Crede Rx in remote area
    - Vit A oral
    - L & Oint Teta in endemic area for Trachoma

Model of Health Care delivery System

1° eye Care ⟷ 2° Eye Care ⟶ 3° Eye Care

Mobile eye Services

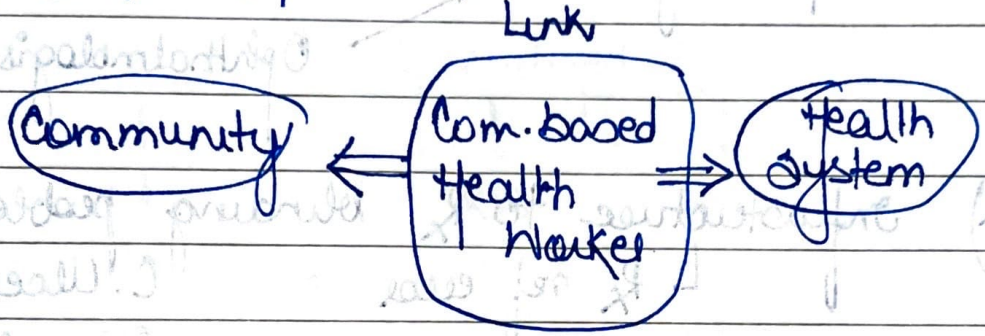
My NoteBook Sign.

1° Eye Care

a) Include
- Preventive measures
- Promotive
- Curative actions

b) focus on Education & Community participation

c)



d) Health Worker
Identify 3 maj symptoms of
- Vision loss
- Pain
- Red eye

↓

action — Needed Ab.
Refeual to Next level
eye shields

Kit
- Vit A Capsule
- ZnSO4 eye drops
- Bandages
- Sticking plaster
- Hand Torch
- Vision Measuring chart
- Antibiotics
- Epilation forcep

My NoteBook

2° Eye Care

a) facilities — for Mx of Common blinding conditions

b) Training of PHCW at PHC

c) Hospital / dispensary → Ophthalmic Assistant
Gen. practitioner
MO trained in Eye
Ophthalmologists

d) Infrastructure to Rx blinding problems
- Rx ref. error
- Cataract
- Entropion
- Trachiasis
- C. Ulcer
- Endoph.
- O. Trauma
- PACG

Screening for POAG & R.

3° Eye Care

Large Institute In Urban level ⟺ Major hospitals & Medical colleges

Services

- Mx of rare disease
- Care of dis ⊆ specialized Rx
  - C. graft
  - Paediatric Cataract Sx
  - RD. Sx
  - Mx of Ocular & Orbital Malignancy

4 Things
- Expert Tech leadership
- Training of 2° level ppl
- Ophthal as 1° Health. PSM level
- Research

Sign.

My NoteBook

Mobile Eye Services

Nepal, India, Africa ⟹ Eye camps

↓

Periphery & Remote areas

Components

- Optom
- Nurses
- Tech

NGO → Eye Camp ← govt aid

x Mainstay of Rx

Educate — Central body

- Train → Prog
  - local problems → financial & human resource available
  - priority of ppl → financial & human resource available
- evaluate all activities → set target to achieve goals

1° HC + 2° HC.

Social responsibility of govt to ensure
↓
equitable distribution.

Sign.

VISION 2020

DELTA Pg No. 19
Date / /

global initiative for elimination of avoidable blindness

NGO
Prof Associat"
WHO — IAPB

Eye Care Institutes

56 WH Assembly May 2003 — Vision 2020 accepted

Launched in 1999 — WHO.

Updated in 2006

Replaced by global action Plan (GAP) 2014-19

Concept → Right to Sight

Aim. → ↓ prevalence of avoidable VI by 25% 4m baseline 2010 → 2019

Objectives →
- ↑ awareness to causes & solution
- Advocate for & secure necessary resources.
- planning, development & implementation

Sign.

My NoteBook

DELTA Pg No.
Date / /

Scenario / Data

Blind
37 million

↓ Vision
124 million

161 million ↓ Impair (90% in poor)

Rate

1-2 million → go blind
1 person / 5s
1 child / every Minute

Age

> 50yrs → 82%

< 15yrs
1.4 million

Sex

♀ > ♂

Region

South east Asia
11.6 million

Western Pacific Region
9.3 million

Africa
6.8 million

My NoteBook
Sign.

75% blindness

Treatable.

37 million → 75 million in 2020.

estimate.

Area of focus

Proper data collection
- to know magnitude of problem.
- thru political & financial support

Promotion of Integrated eye health services
- Interface & programme to augment eye health

Fostering engagement of multiple sectors.
- so services even to most poor

Multipronged approach

Identification of Community & ↑ level of blindness

Provision of eye care infrastructure & manpower

Supply of affordable high quality care by mixture of resources gen.

DELTA Pg No.
Date / /

Responsibilities

- ↑ awareness of blindness
- control of may cause of blindness
- train ophthalmologists & other eye care personnel
- create infrastr to manage problem

Strength

Partnership b/t

- Eye care personnel
  - Nurses
    - International org
- Ophthalmologist
  - Optom
    - National Ministries of health
- O. Assistant
  - Corporate eye care provider

Under IAPB

↓

Task force ↕ collaborate

↕

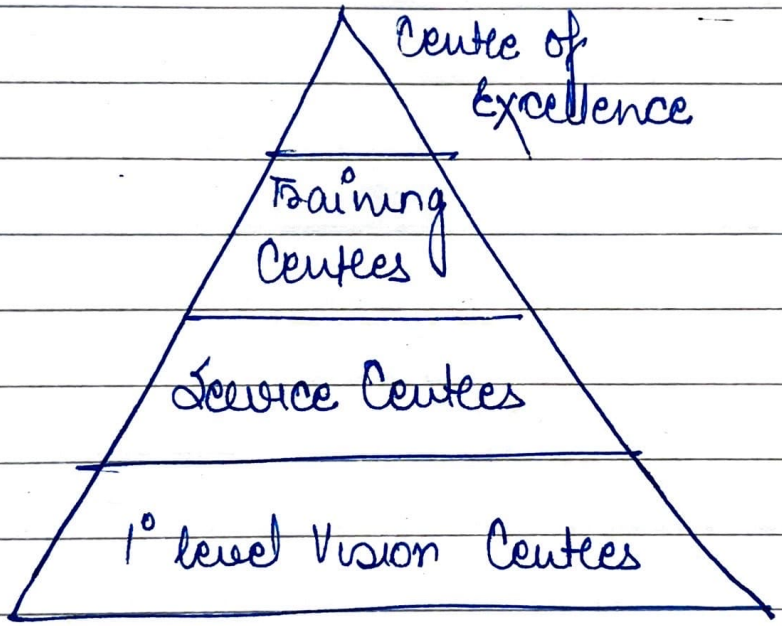
NHO

VISION 2020 implement. ←

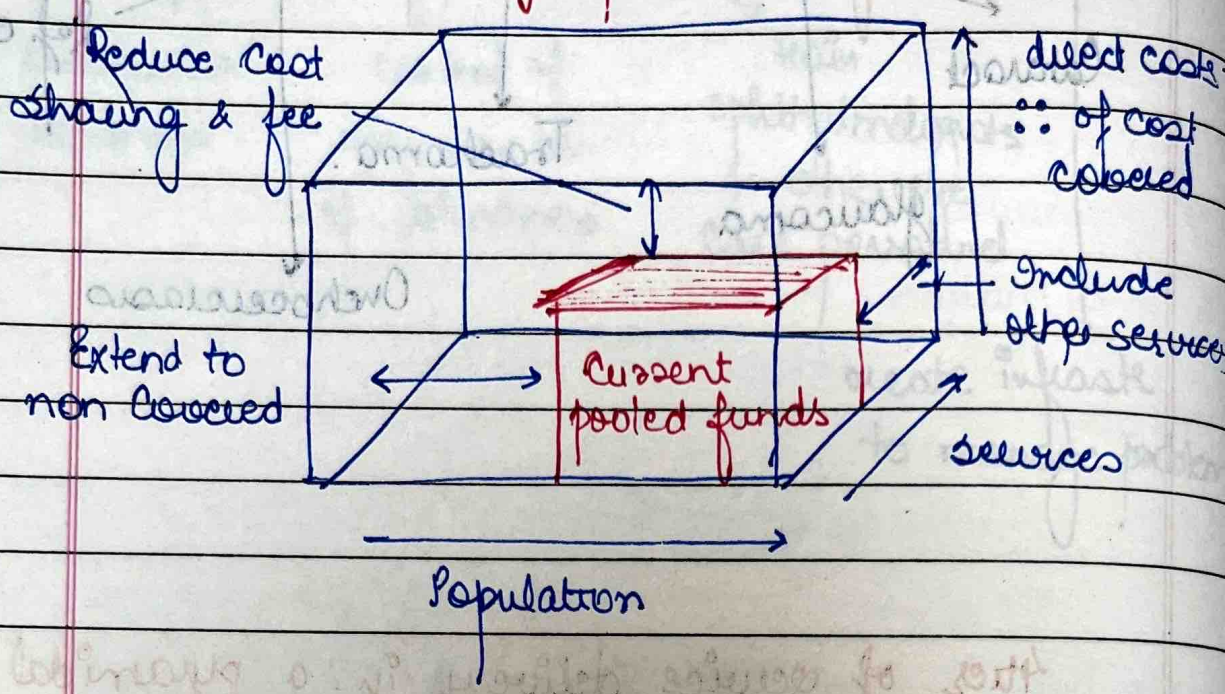
focuses on 5 main priorities

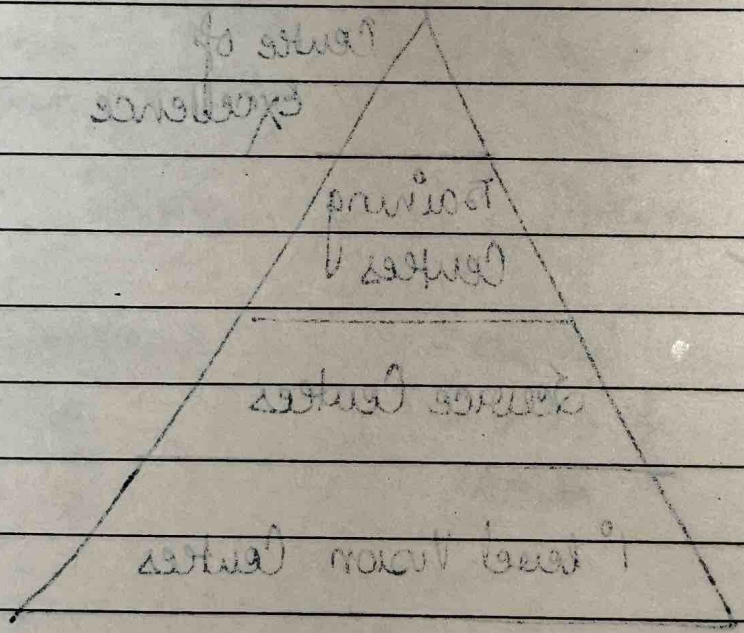
- Cataract
- glaucoma
- Trachoma.
- Onchocerciasis
- Ref. error

4 tier of service delivery in a pyramidal str



Planning process





Specific blinding disorders & approach to prevention of blindness.

DELTA Pg No. Date / /

Cataract

Global view

50% blindness in the world
Prevalence - 1-4%.

exist
- ing → earlier
- develop
- ed

↑ prevalence of blindness 4m Cataract

Rf → UVB, Cs, Malnutrition, dehydration states, diabetes

Intervention for prevention & Rx

1° → screen → motivate

2° → Dx & Quality

3° → Complicated cases
Subluxated lens Cataract
2° → training

My NoteBook

Sign.

Glaucoma

15%

POAG »

PACG → Eskimos, Japanese, Hypermetropes, shallow AC

Present Uni.

is Bil :. 2nd eye 40-80%.

Chance of attack in 5-10yr.

I&T

Irreversible ∴ Early detection & Rx

RF
- >40yr
- ↑IOP
- +ve family H/O
- +ve alcohol & smoking H/O.
- Myopia
- HTN
- DM

↑ IOP — 21mm Hg (Specificity — 91.7%. Sensitivity — 65%.

↓

VF, fundus.

2 Stage

IOP, fundus ⟹ fields

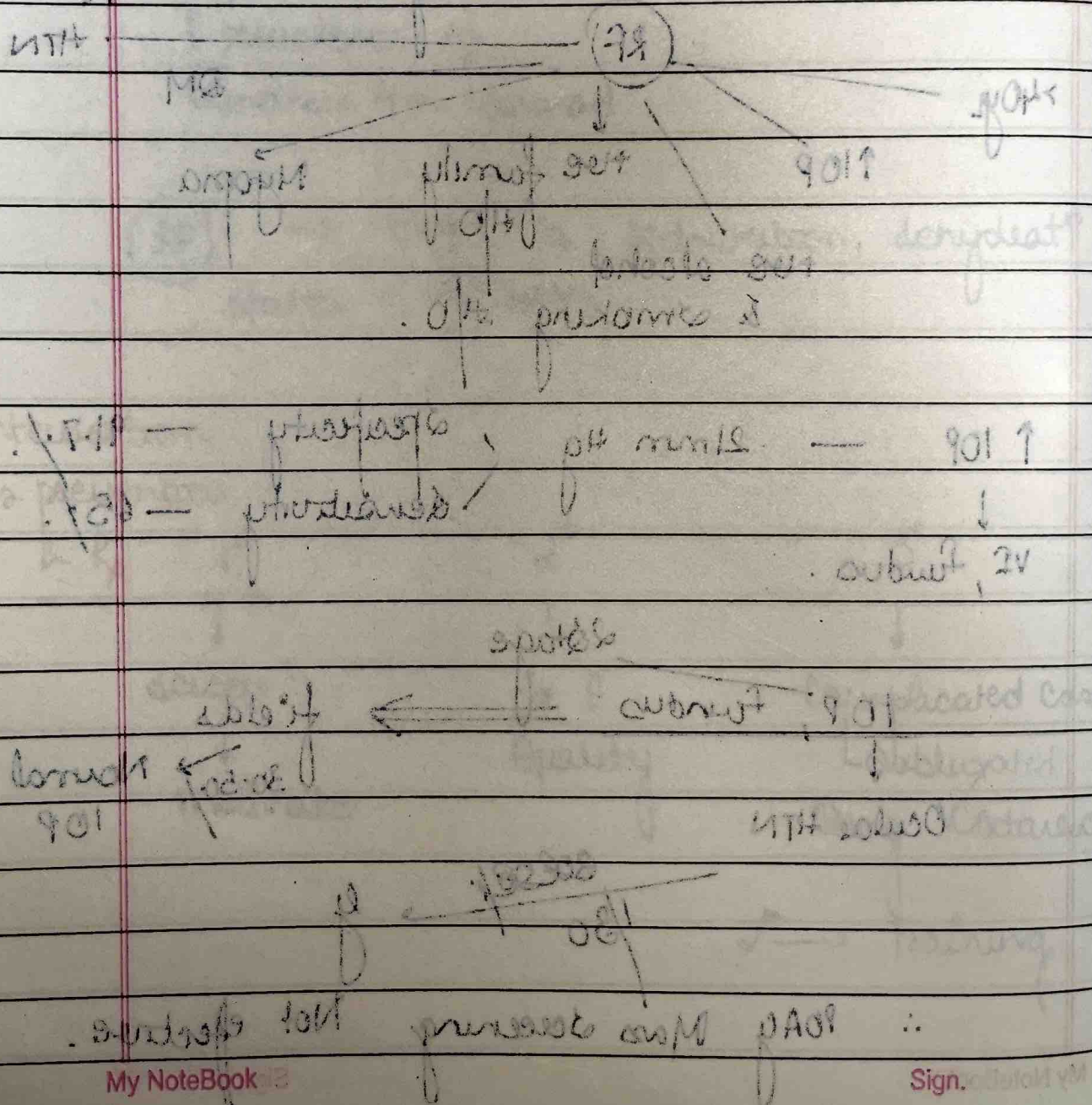
- Ocular HTN
- 30-50% Normal IOP

~~80-90%~~ 1/30 → G

∴ POAG Mass Screening Not effective.

✓ effective for PACG

- Acute red eye & pain
- ↓ vision
- Cloudy Cornea
- Shallow AC
- Dilated pupil



Diabetic Retinopathy

DELTA Pg No. 24
Date / /

Global views » developed. bt ↑I in D.ing.

∝ duration

>20yr — 100%. ✓

Sight threatening retinopathy

6% per yr

2/3 — Maculopathy

1/3 — PDR.

I&P. Screening — Ophthalmoscopy
× FFA.

1° level → lifestyle changes

2° → Early Dx of Type II
- disc Periodic review
- Refer for LASER

3° → VH Rx.
↓
VRSx.

Type I — at Onset exam
Preg → ↑ progression.

Eye Camp

DELTA Pg No. 26
Date / /

Evolution
↓
Purpose
↓
Types
↓
Steps involved in planning
↓
a) Pre Camp Activities
↓
b) Camp day activities
↓
c) Post Camp activities
↓
d) Camp follow up activities
↓
Community participation
↓
Monitoring & Evaluation
↓
Human Resources
↓
Financing → Publicity → Eye Camp

My NoteBook
Sign. template.

DELTA Pg No.
Date / /

Evolution of Eye Camp

Cataract Screening & Sx Camps

↓

Cataract Screening Camps

↓

Seperate Camps targetting diff age gps

↓

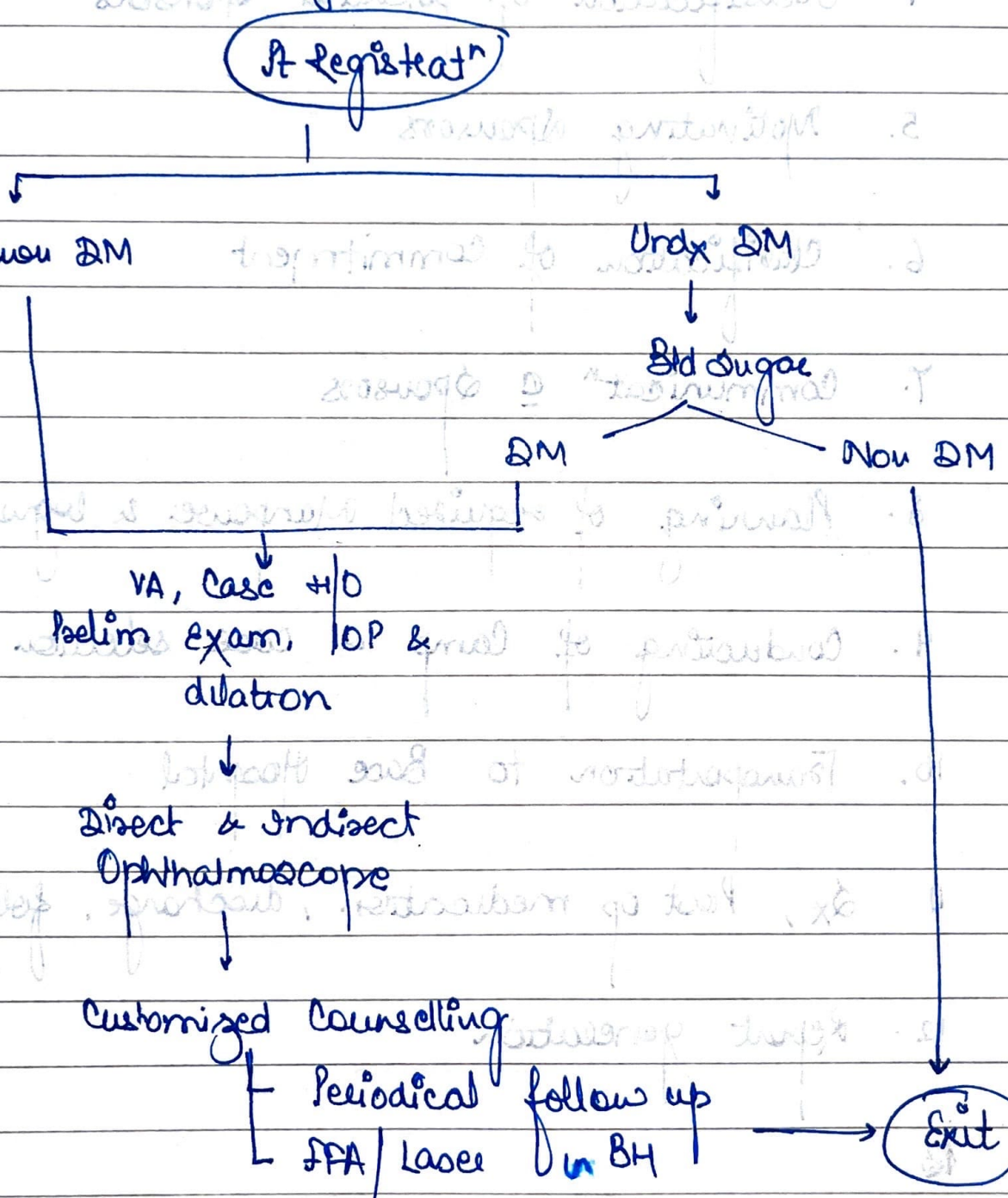
Compechensive Camps.

✓ Light direction of achieving vision 2020
↑ health seeking beh
Early detection of major eye problems
Wider market of eye care

✗ » Manpower req

Types of Eye Camp

Screening or Dx Eye Camp
Surgical Camps
AR Screening
Work place Based Screening
School Children
Paediatric Screening

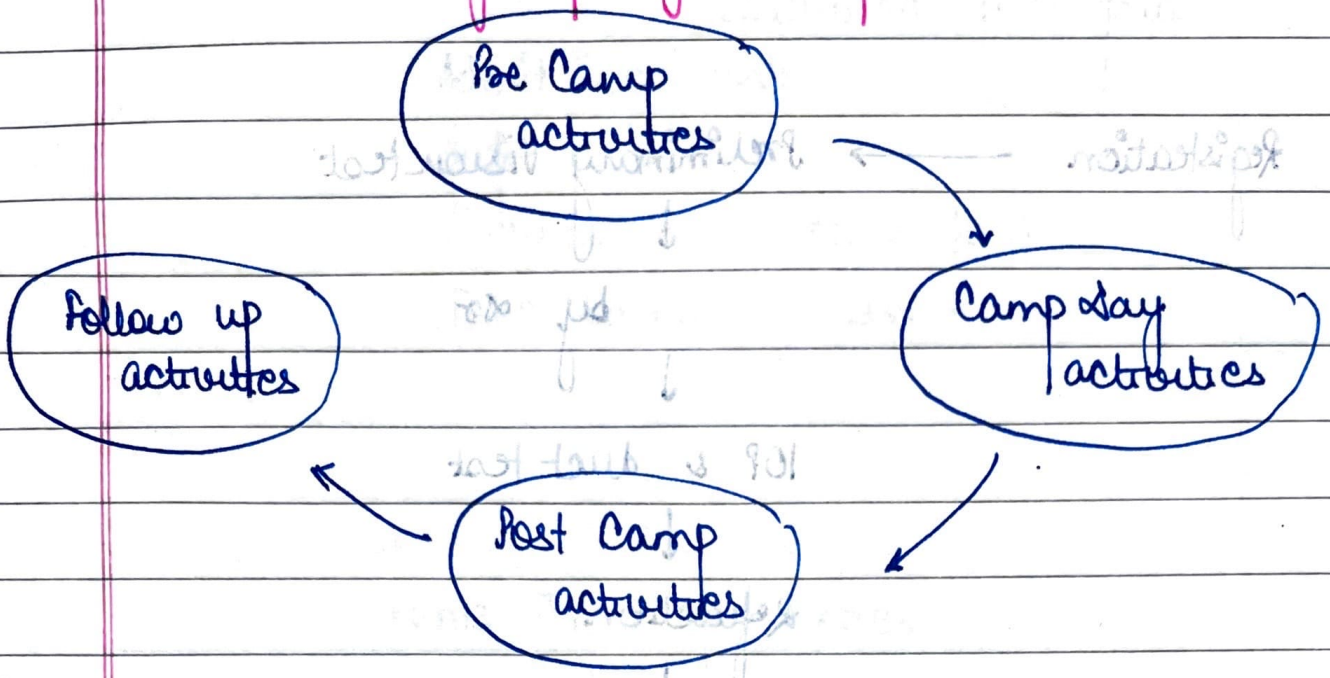


DELTA Pg No.
Date / /

Steps involved in planning Eye Camps

1. Determination of jurisdiction
2. Collection of Baseline Information
3. Selection of potential locations for Camps
4. Identification of potential sponsors
5. Motivating Sponsors
6. Clarification of Commitment
7. Communicat^{n} ⊆ Sponsors
8. Planning of required Manpower & logistics
9. Conducting of Camp & case selection for Sx
10. Transportation to Base Hospital
11. Sx, Post op medication, discharge, follow up
12. Report generation
13.

Planning of Eye Camps



Pre Camp Activities

Determination of location of eye Camp

↓

Selecting Camp site

↓

Choosing Camp date & Time & Case

↓

Predicting Size of Camp.

↓

Predicting Equipment Needs.

DELTA Pg No.
Date / /

Camp day activities

Registeation → Preliminary Vision test

↓

by dr

↓

IOP & duct test

↓

Refraction

↓

Final exam by senior Dr

↓

Medicine description

glass prescriptn

↓

Optical dispensing devices

↓

Out

Pt adviced for Sx

Pt referred to Spl Rx

↓

Counselling

↓

Admission & transport of cataract pt

Sign.

Post Camp activities

- Admit inpatients
- Inform ors
- Provide pt & acc & food.
- Take Camp Records.

Camp follow up activities

- Write Thank you letters
- Arrange follow up appointments
- Attend. Weekly outreach meetings
- Stay in touch & sponsors

Sign.

DELTA Pg No.
Date / /

Role of Local Community

Camp Medical officer

↓

Outreach Manager

↓

Camp Organisers

↓

Administrative Staff

↓

Sponsors

↓

Vehicle Co-ordinators

Financing an Eye Camp

Publicity

↓

Cost of lunch for admitted patients

↓

Transport of pt to & fro 4m SH

↓

Any expenses of Volunteers

↓

Miscll Costs.

Publicity of Eye Camp

Why publicise

↓

What Media are used

↓

How to ensure full effect

↓

What area shd be covered.

Sign.

National Programme for Control of Blindness In 12th FYP — An Overview.

Introduction

1976
1.4%. Prevalence of blindness] goal
2020 0.3%.

Single largest NHP ≤ 640 districts In India

Eg of Public Private Partnership (PPP)

NPCB. In. 12FYP —— approved by MOH & FW since 2013 April.

↓

Part of Non Communicable disease (NCD)

Implementation

Decentralized approach

Thru District Health Societies

by

District Programme Manager (DPM) of District Health Society.

DELTA Pg No.
Date

Objectives

Develop & Strengthen Strategy for Eye Health.

def as per NPCB

- Visually Blind — < 3/60
- Severe Visual impairment — < 6/60
- Moderate — < 6/36

Causes of Blindness

2001-02 — 1.1%

2007 — 1%

goal is to ↓ prevalence 1% to 0.3% by 2020.

My NoteBook

Sign.

Prog Strategies

6 million Cataract Sx

Sx Rate 4800 Sx / 10 lakh populat^n

>95% are by μsx tech.

Recurring Grant in AID. (g/A)

Rs 1000/ cataract Sx.

Rx of Childhood blindness — Rs 1000/- Vol Org

In Eastern hilly areas — Rs 75 lakhs

On Contract Basis

- O. Surgeon 250
- O. Assistants 425
- Eye Donation Counselor 150.

Establishment of Regional Institute of. Ophthal

20 R10

describe their role.

Vision Centres

> 3000 PHCs

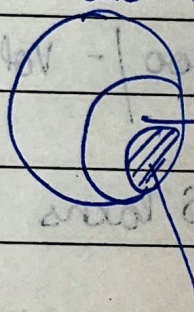
PMOA → Paramedical Ophthal Assistant

Non recurring GIA of 40 lakh to NGO to strengthen Rural services

Eye Bank

15 million Blind

2017



6.8 million — Cornea

<6/60

1 million — Bilateral

10 million by 2020

Rs 2000/- every pair donat collected

Equi of Rs 25 lakh

Human Resource Develop.

2500 eye Dx trained

30 training Institutes

Sign.

Information, Educat^{n} & Communicat^{n} (IEC)

↑ Community awareness

NPCB

RBSK

↓

Rashtriya Bal Swasthya Karyakram

↓

Physical
Vocational
Social

Ministry of Social Welfare & Empowerment

New Initiatives in 12th FYP.

- free spectacles for near work to old persons suffering from presbyopia.
- Development of MBMOU Multipurpose District ~~Mobile~~ Mobile Ophthalmic Unit

40 proposed in state.
» NE Hilly area.

Tele Ophthalmology

60 lakh for mobile tele Van

Rs 15 lakh for each unit

Mobile replaced by fixed vans

Achievement

94.6% Cataract Sx

27,19019 spectacles

221351 Successful eye donat^{n}.

1850 O.T. Sx. tedured

126 Mx college.

82 Eye bank & 177 Eye donat^{n} centres

44 Eye Wards & Eye OTs

53 NGOs

27 TeleOphthal

2298 Vision Centre at PHC

Neuroprotection in Eye

Ciliary Body — storehouse for several growth factors :-

- CNTF (Ciliary Neurotrophic factor)
- BDNF (Brain derived Neurotrophic factor)

↓

support / promote Neural growth
» after retinal injury & develop^{n}

To treat retinal deg ← DR
← ON Axotomy

↓

CNTF given — Topical
Long term delivery via Adenoviral vectors.

(•) NPCE → PEDF. (Pigment epithelium. derived factor)
RPE

- Anti angiogenesis
- Role in preventing retinal injury
- Photoreceptor damage fol light exposure.

Neurodegeneration

ET ↓ → GON, Photoreceptor deg.

CE → cytokines → ↑ in AH after ↑ IOP

∴ Known R•f for Glaucoma

Ocular Stem Cells

DELTA Pg No. 38
Date / /

found in peripheral margin of post natal mammalian retina & in Ciliary epithelium

↓

Neuro-epithelial origin

↳ Early retinal neuronal progenitors

express [PAX6, Chx10. - homeodain transcription factors] Amacrine RGC Bipolar

Mammal — Retinogenesis ceases after birth

EGF, FGF2, Insulin

↓

Stem cell in CE ⟶ Neurospheres

⇓

expess Nestin (Intermediate fil pr) ↳ marker for NE & glial stem cells

↓

Divide Asymmetrically generate RBS

CE stem cells do not form Retinal Neuron

↳ ⇓ Neurospheres that forebrain stem cells

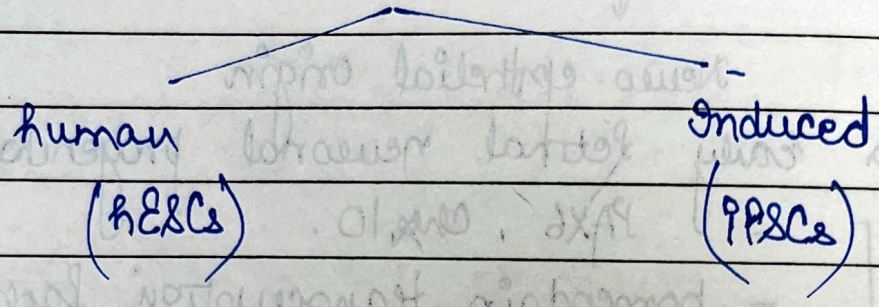
↳ Notch signalling pathway.

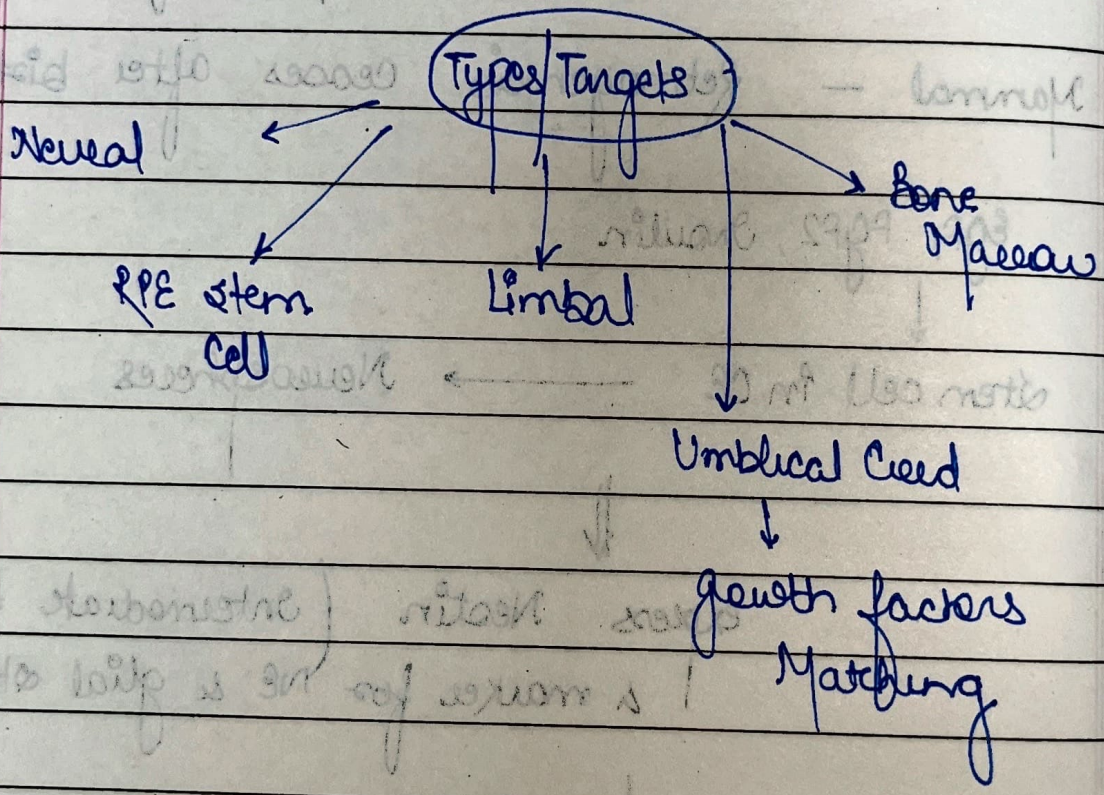
molecules expressed

other — Delta1, Notch1 ↓

My NoteBook Sign.

1) ~~Pluro~~ Pluripotent Human Embryonic stem cells





a) RPE stem cells — AMD
Stargaet

b) Cornea repair — limbal
→ COMET
Auto
Allograft

My NoteBook
Sign.

c) Trabecular Meshwork, or Ciliary epithelium

d) Lacrimal gland — Nestin, Ki67

e) Orbital tissue (fat & Mal)

- Tx resect^{n}
- ud reconstruct^{n}
- Cosmetic

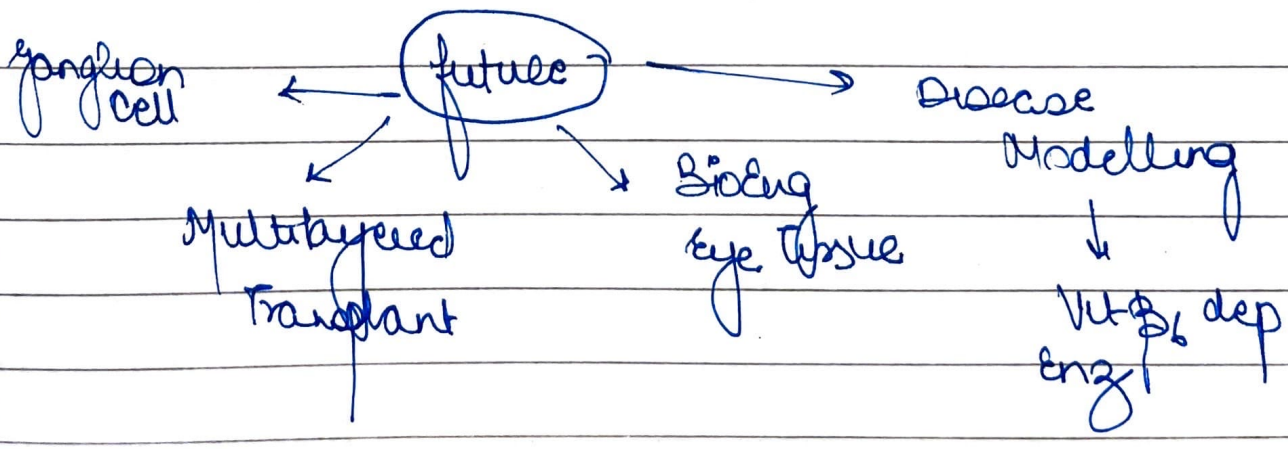
f) Adipose derived stem cells

↓

Os reconstruct^{n} — & deg

Can regenerate tissue like Cay & tarsus

- via programming
- Photo damaged skin rejuvenation



DELTA Pg No.
Date / /

Recent Advances

Non Refractive Corneal Sx

(a) Endothelial Keratoplasty

PLK → DLEK → DSEK → DSAEK → DMEK

- DMEK ⊆ stromal rim (DMEK-S)
- DMAEK.
- Ultra thin DSAEK – <100μ
- Use of Rho kinase inhibitor to resolve Corneal edema
- Doing descemetorrhexis only ⊆ out graft
- FEMto second DSEK
- Cultured Endothelial Cells.

Newer in Glaucoma Screening

- Frequency Double Tech of Perimetry
- SWAP.
- mERG
- mVEP
- SITA version of SWAP
- 24-2 c.
- Telemedicine
- Gene test ⊆ name of Ocugene

FDT

<2 min — glaucoma pt

<30 s — healthy pt

Inexpensive

Portable

No expert tech req.

Can be used ⊆ adults ⊆ reading disability

Cornea & Refractive Sx

- Novel use of Trypan Blue dye to stain fungus in Cornea staining on KOH Mount
- C3R
- DSAEK lenticule assisted BMT
  CL
- Intralase stromal pocket
  Slit lamp based — CI.
  PACK — Non Healing Ulcer.
- Rose Bengal Photodynamic Antimicrobial
  Rx for Pt c/ Progressive Infectious keratitis
- Bowman layer onlay Transplantation to Manage Herpes Corneal Scar — also for KC
- Sutureless femtosecond LASER assisted ALK using a bioengineered Cornea as a viable alternative to Human donor Transplantation for superficial Corneal opacit

- Corneal Bioprints — Collagen based
- Artificial Cornea — Silk
  Dried Cocoons

Dx

AI

↳ Hyphae detection in fungal keratitis images ⊆ adaptive local Binary pattern

Confocal

→ ROCK inhibitor — Endothelial decompensat^{n}

↳ Ripasudil eyedrops 0.4%.

↳ Inj. intracameral

→ Descemet Stripping only for a chronic DMD after cataract Sx

- Biolenticule

Use of intrastromal lenticule in Rx of KC

Hyperopic lenticule.

Reverse geometry

(7mm). Larger size (9mm) better

My NoteBook Sign

Ocular Surface

Bil LSCD

Het Surface

~~Total LSCD — b~~

Post allogenic CLET

" " SLET

Boston type I KPro

Anj Surface

MooKP.

LVP KPro.

Type B Boston KPro

- Amniotic — by Auto
  for SJS pt.
  Bedridden.

Presbyopia

Kamra Inlay
Kain deep
Presbya ulens

No dissection SMILE ✓

Cornea 3D printing.

SOMAT – ~~Cultivated Mucs~~
Simple Oral Mucosal Transplantation

Natamycin clear solution

Paediatrics

Amblyopia Mx : Pleoptics
CPM stimulator
Vision stimulation
Levodopa-Carbidopa ← Pharmaco Rx — Amblyo3
Liquid Crystal shutter glass
IL Pad

Coat Rx (combined Occlusion & Atropine Rx)
with Augmented Part tothe patching
for children & refractory amblyopia
– dichoptic stimulus (Anaglyph 3D glasses)

Myopia Mx — ATOM 1,2 — Atropine —

Imaging in steabismus

Surgical Procedure for Correcting globe dislocation in high myopic steabismus

↓

Band loop Myopexy

- CFEDM
- AESTA imaging fast imaging employing steady state acquisition for 3,4,6,5 Nexes
- Dyanamic - DRLS, IMGTP

Paediatric Cataract-

- ZEPTO - Precision pulse capsulotomy

My NoteBook

Newer Sx in Strabismus

- Msl transplantation
  Posterior fixatn c adjustable recessions
  Flap tear
  Mini tenotomy & mini plication
  Anterior Superior Oblique tuck
  SO sheath
  Periosteal fixatn of SO M
  Medial translocation of LR
  Lacy mini flap Sx
- Botulinum toxin as replacement for traction sutures

Botox

MISS (Minimally Invasive Strabismus Sx)

- use of uscope
- Cay opening far away from limbus
- Performance of all feasible Sx steps through tunnels
- ↓ of total Cay opening size by several keyhole openings
- ↓ of no. & size of Cay opening by using transCay suturing tech
- Minimization of periop tissue disruption

All Sx can be done

Adv

- Fibrin glue

My NoteBook

Step by step

DELTA Pg No. 30
Date / /

Cataract New

- 3D viewing System
  - Astevo 2ciss
  - Inguenity (Qecon)
    - ↓ illumination (↓ 20-30%)
    - other Benefits
- IntraOp OCT — 2ciss | Precision Lumpcs
- Verion Image guided Dx Plus — Correct Astigmatism
  - Toric IOL
  - Reproducible incision
  - ↓ Edema
- FS Laser Arcuate incision ↓
  - depth
  - length & position
- Modify Donald field Nomogram
- Treable Precision

Capsulorrhexis

Femtosec Catalys 1.55 | Lensx >

Total = time

Seperate Machine

- Vision guided.
- Zepto guided
  - 4mm
  - Vaccum
  - Nitinol.
  - ✓ Assistance req.
- CapsuLASER. — On uscope itself
  - 2019 @ USA
  - Not in India

Nuclear #

Laser assisted — FS

↓

- miLOOP from Zeiss
  - > Hard Cataract
- Phaco Pre Chopper

IOL

DELTA Pg No.
Date / /

Sanoptix

AMO — Eyehance — x Rings issue

Violet light filtering IOL

Biometry

SS OCT

Anterion

Iteace —— Abberometry

└ dysfunctional Lens Index

↓

Abberation { Cornea / Lens

- Olsen C
- Hill RBF — Radial Basis activat" fxn
- Super VA DAS

AI

Kane formula

Ray tracing — Theoretical IOL power calculations

7 variable

↓

Holladay 2

AI based

↓

Hill RBF

Clarke Neural Network

Ray tracing — Okulix

Phaco Optics

Newer Visco-elastics. – ↑ density Capsulorhexis
1.8% NaH
2.3% NaH
– Hypeematrec
– Rhexis does not occur.

– Viscoat

Retina

DELTA Pg No.
Date / /

Imaging | Medical | Surgical

Imaging

a) WF & UWF
   - Fundus
   - OCT
   - OCTA
   - FA

b) Pediatric Retinal Imaging

c) Intra Op OCT — ERM removal

d) Adaptive Optics Imaging — CSLO

Ingenuity

Medical Retina

a) Drug delivery — Suprachoroidal
↓
Steroids

2) Subcutaneous Adalimumab — Humira
for uveitis

3) Newer Anti VEGF
- Brolucizumab 6 mg/0.05ml
- Conbeceptcept — chinese
- Faricimab
- Abicipar

4) Port delivery system
- Ranizumab
- Brimonidine
↓
.gA

Rx Retina

- Endoscopic Vitrectomy — scleral Cornea
  - KPro
- Hypersonic Vitrectomy — milliamin
  - Hypersonic vit Dual Blade
- 3D Heads Up. Vitrectomy — ergonomics
  - Ergonomics
  - Training
- Robotics — arms — Peeling, & Segmentation
- Gene Rx
  - Seg, Style
- Genomic Editing
  - Brilliant Study — 3
- Luxturna

Stem cell Rx
- IPSC
- HLA matched one
- ↓
- GA

- Fibrin glue in RD Rx.
- Maxwell Sponge — Vitrectomy

DELTA Pg No.
Date / /

Vexel

- Suprachoroidal Visco as Buckling agent
- Illuminated indenter
- Handheld devices] imaging
  Smartphone

Oculoplasty

0.4% PVP-I eye drops
1% povidine for gargles | Covid era

- Acute invasive Rhino Orbital Mucormycosis
  - ↓ FESS
  - ↓ Pack ± Amphotericin B
  - ↓ Radio-opaque Silicon Catheter
- Active TED
  - Rituximab
  - Tocilizumab
  - Teprotumumab → IGF IR ab
    - 500 mg/vial
    - every 3wk
    - every 8wk
- Hypoglycemia
- X in. Sight threaten" diseases
  - ↓ steroid used earlier
  - 11 Inj vial
- Total Inj
  - 10 mg/kg (1)
  - → 20 mg/kg (7)
- Triamcinolone inj in fornix
  - ↓ CAS
  - ↓ Hsd reaction

- RED &x — Stereotactic Navigation &x
  ↓
  Improves Steabismus Outcome

- Computer assisted Navigat^ in Orbitofacial &x

- Customized 3D printing
  - Orbital #
  - Migrated Orbital implant

  Custom orbital implant that allow
  for Augmentat^ & reorientation by
  3D printing
  Rapid prototyping

- Topical Timolol — pyogenic granuloma
  4 wks

- Mild ptosis — Oxymetazoline 0.1% OD
  1 mm correction
  ↓
  Day 14

DELTA Pg No.
Date / /

- Bleomycin use for Low flow lymphatic malformation
  0.5mg/kg IV 10-15U.

S.E

- TransConj approach for Orbital #
  - Looking forward

O. lymphoma – Bendamustine
Copanlisib
Lenalidomide.

IBD4 POD — Infliximab
Abatacept

Glaucoma

Dx

- Virtual Perimetry
  - OCTA
- S. in children
- iPAD.

Virtual perimeter — also including pupillometer

Medical

- ROCK inh.
- Pmo — 35°4m fovea
- C3 field Analyzer

Pmo — head mount

uses modf ZEST (zippy estimated by sequential tech) algorithm old AIZE (Ambiant Interactive Zest)

↓ time by 70%.

⇒ C3 field Analyzer

- Endoscopic CP
- MIGS

Supra threshold std fast

a) Pre perimetric
b) Unilateral eye
(Biomarker for early perimetry)

Aqueous
Angiography
L. fluorescein, ICG

OCT

Nerve head slab
ILM – 150μ

Radial Peripapillary Capillary slab
ILM to post limit of RNF

Choroid slab
RPE to 2000μ post-

OCTA ↓ reduction in density of superficial vessels

ROCK inh

Che 2

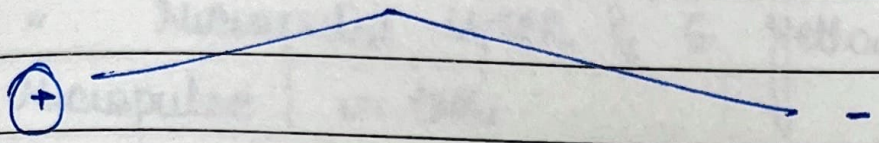
↑ AH outflow
↑ Cell permeability
↑ relaxation
↓ Cell adhesion
↓ ECM production

↑ Neuroprotection

↑ Bld flow
↑ Axonal Extension
↑ RGC survival

↓ fibrosis

Ripatec – Ripasudil 0.4%.
Rhopressa – Netarsudil 0.02%. + NET 9mh.
Rocklatan – 0.005% Latanoprost



facilitate Corneal Wound healing
- x ACG use
- Conj - hyperaemia
- Protect TM cells frm Oxidative Stress
- Vasodilation
↓
» Conj hyperaemic
- Improve Bld flow to Optic Nerve

→ ↓ bld. scaling in glaucoma Dx

⇒ Latanoprost Bunod

1) Trabeculome
2) Kahook Blade
3) GATT

IPAD — Paediatric pt
Cost effective

1) Bimatoprost 0.03%
2) Travoprost punctal plug

DELTA Pg No.
Date / /

1) New in LASER

1. Pattern Scan laser in PDR & DME
2. Micropulse LASER
3. Sub threshold Micropulse LASER
4. " Diode " "
5. " Micropulse LASER & ≤ Yellow laser (577nm
6. Micropulse in CSR

2) Glaucoma

LTP + Cyclo P

↓

Micropulse Techn (Iridex)

on off time

Micropulse / laser Trabeculoplasty

\ Cyclo Photo Coagulation

DELTA Pg No.

New in Electrophysiology

- VEP — objective measure of refractive errors
  - Early stage of Chloroquine maculopathy
    - P100 latency
  - TON

- Multifocal ERG — Pre-perimetric glaucoma
- Lymphoma → ↓ ERG amplitude (↓b)

- Flash ERG — Diffuse retinal disorders
- Multifocal ERG — Localized " "

Sign.

Keratoconus

1) Cellular & of Corneal stroma — new type of C. Sx for KC & C. Dysteophy

2) Manual mid stromal dissection as a low risk procedure to stabilize mild to moderate Progressive KC

3) Bowman layer Transplant

4) C3R

Recent Corneal Imaging

Topography

Scheimpflug

↓

C. screening

Ultrahigh speed Scheimpflug (Corvis ST)

↓

IOP
Biomechanics

Tomography

UHR OCT

↓

Ocular Tx
DR.
Neutrophic K.
Early KC identify

IntraOp OCT

↓

- graft orientation, DSEK \ DMEK
- Big Bubble tech of DALK
- Lens position in Cataract Sx

Confocal Microscope

a) C. Endothelium
2) Subbasal Corneal Nerve plexuses Morpho after KR procedure
3) DR Dx
4) ~~Dx~~ → detection of Corneal immune cells

My NoteBook
Sign.

DELTA Pg No.
Date / /

Densitometry

- Assessment of c. age
- Corneal health
- subclinical KC

Angiography

- of c. vessel
- invasion in C. graft

Macular Hole Sx

1) Advances in Sx
2) Chromoviteectomy using dyes to help visualize the ILM
3) Tamponade type & posturing requirement
4) Combined lens Sx
5) Sx Adjuncts

(b)

ICG
Trypan Blue
Double Plus
ILM Blue
Brilliant peel.

DELTA Pg No.
Date / /

Newer Innovations in MH & Sx

a) Inverted flap tech

b) Temporal flap tech

c) Autologous Bld plasma

d) Autologous NS Retina free flap

Wet ARMD

DELTA Pg No.
Date / /

Pathogenesis & Rx

- PDGF.
- Thrombospondin I
- Integrin family
- Angiopoietin 2 — Inhibiting Ang 2 & activating Tie 2.
- Bevacizumab
- Fovista + Anti-PDGF
- Lucentis + Eylea
- Tyrogenix
- Abicipar Pegol — DARPin (Designed Ankyrin repeat protein)
- Squalamine lactate — bind Calmodulin → ↓NV
- Single chain Ab fragment VEGF Inh RTH258.
- SiRNAs — target mRNA
- L Bevasiranib
- Anti integrin &
- Resveratrol — Polyphenolic anti-oxidant ↓ MAPK activation

- Ranibizumab Port delivery system
- Aflibercept Hydrogel Depot
- Nesvacumab — against Ang2.
- ICON-1 chimeric protein designed to bind & inhibit tissue factor.
  EMERGE study ✓
- Caratuximab — chimeric Ab to Endoglin
- Dry AMD — Photobiomodulation
  Brimonidine
  Minocycline
  Lampalizumab.

Brolucizumab

DELTA Pg No.
Date / /

humanized single chain Ab fragment ⊆ ↑ affinity to all VEGF A isoform.

↓ Mole Wt ∴ can be given upto 6mg | 0.05ml
- Longer duration of action.
- Better ocular tissue penetration.

OSPREY trial / ⊗ 6mg vs Eylea 3mg

fewer Inj
> stable central subfield thickness reduct^{n}

- HAWK & Harrier

-

Sign.

CSCR

- Mineralocosticoid Receptor Antag.
  - Eplerenone 25mg/day
    - ↓ x1wk
    - 50mg/day
- Rifampicin — Induces Cyto P450 → ↓ steroid metab.
- Mifepristone
- Finasteride
- Diamox — acidification of subretinal space by modulation of CA 4 in RPE & ↑ in retinal adhesiveness
- Melatonin
- Propanolol
- ↓ dose Aspirin
- H. pylori Rx
- Anti VEGF — CONTAIN Study

My NoteBook
Sign.

Vitrectomy

DELTA Pg No.
Date / /

In Machines
- New probes
  - Dual pneumatic
  - Two dimensional cutter
  - Ultrasound
  - Harmonic
  - Vitrectors

- Endoilluminator & Chandelier System
- Smaller guage
- Valved Cannulas
- Wide Viewing System
- Tamponade
- miOCT — Leica Enfocus
  - Haag Streit OCT
  - Zeiss PESCAN 700
- Heads up Sx
- Lyes
- Endoscopic vitrectomy
- Suprachoroidal Buckle — Hyaluronic Acid
- Solvent passage of PFC Into SR Space
  - IL Visco Injected
- Anti VEGF before Sx

Sign.

DELTA Pg No.
Date / /

1/2 fluorinated alkanes — F_6H_8 — Inferior RO

Pterygium

- APLT
- Mitomycin C , 5FU
- Anti VEGF SubConj
- Intra SLET
- Intralesional steroid
- Insertion of multimicroporous expanded PTFE
- CRISPR - CAS 9 ⇒ gene scissor
  - L gene Targeted Tech.
- Bevacizumab
- Ranibizumab
- Bevacizumab
- APR 246 | PRIMA-1 ⇒ ↓ Sq. Metaplasia.

NSAIDS

DELTA Pg No.
Date / /

Saulfer

Flu 0.03%.
Diclofenac 0.1%.
Ketorolac — 0.5% — SAC

Prolensa (Bromfenac 0.07%) BL
Flexro (Nepafenac 0.3%)

Recent Advances in Cornea Transplant

PK — LK

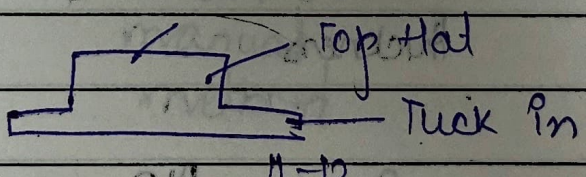
Ant — Post-

- SALK
- HALK
- ALTK
- DALK
- TLK

- DLEK
- DSEK
  - Manual
  - nDSEK
  - DSAEK
  - Ultratin DSEK
- DMEK
- DWEK

PK — Femto assisted

8-S-9-S



- ✓ full thickness cut
- ✗ ISD damage
- ✓ Technique Support

DELTA Pg No.
Date / /

SALK

Nucleokeratome assisted

Femosec (FALK) i.e Sutureless

Mid stromal

Pre DM

HALK — Hemi automated

ALK — Keratomileusis in Situ

DALK

Host Corneal Thickness

Donor (B) CT

Ant Lamellar Resection ALR — upto 160μ

MSR — 160-400μ

DLR — Upto Pre DM level — 90-95%

Central 470-495

Peripheral 585-620μ

TLR — Upto DM level

DELTA Pg No.
Date / /

(B)

LD — 160μ

MSD — 160 - 400μ.

Full thickness dermal graft (FTDG)

Endothelium

Tech of DALK

Manual dissection

Open

Closed

Melles

Air assisted manual method

Sign.

Manual

Open → flap edge lifted off

Closed

- Air — ½ teaspunat" → Manual
- Melles — Indentation — Mucoo effect
  Bubble in AC
- Anna Big Bubble
  ↑ Bt OM & steama
  ↓
  Side Incision made
  ↓
  Visco injected
- Hydrodelamination —
  Air → Opacify whole Cornea
  ~~Opacity~~ BSS → Scar does not swells up

My NoteBook Sign.

- Viscoelastic : direction ⟵ b/t steamo & DM
- femto assisted
- Tuck in LK

• DLEK

Std 9mm. Scleral tunnel

Small incision 5mm

• DSEK

Manual

Automated

DSAEK

n DSEK ——— ultrathin

⊖ DM stepping

Sign.

Tech. of graft insertion

- Forceps (Kelman)
- Sheet glide
- Suan glide
- Endoinjectors
- Hutch Sutures
- Taco fold

DMEK → Direct peel - Scuba
Air injection

Moutsouris sign

Kapena tech

DMEK

KP ⊆ Scleral patch

Scleo keratoplasty

Bio Eng. Cornea

Photochemical Keratodesmos.

Rock Inh.

DSD

Dry Eye Disease

- Diquafosol Na — Secretory Mucin
  - L Ag. Secretagogue P2Y2 recep in cornea
  - L Ca^{2+} secretion ↑
    - Nanoemulsions
    - Novasorb

2%. Rebamipide

Lactoferrin — Under clinical trial
↓TNF α IL10

Lifitegrast — Xidra — LFA-1 Antag

Duc teal — Intranasal Tear Neurostimulator

Scleral lens

My NoteBook Sign.

Ocular Allergy

IL1 Antag - EBI-005
IL5 - Mepolizumab — AKC

Lubricin — Mucin like glycoprotein
Lacritin
Dupilumab — IL4
Pitrakinea + IL13

MGD

Intense pulsed light

Lipiflow — Vectored Thermal pulsation

Mibo Thermoflow

Blepex

Tear Care System.

Sign.

Difluprednate

DELTA Pg No. Date / /

Generic name

potent steroid like ~~Latanoprost~~ Prednisolone

0.05%. BD or QID

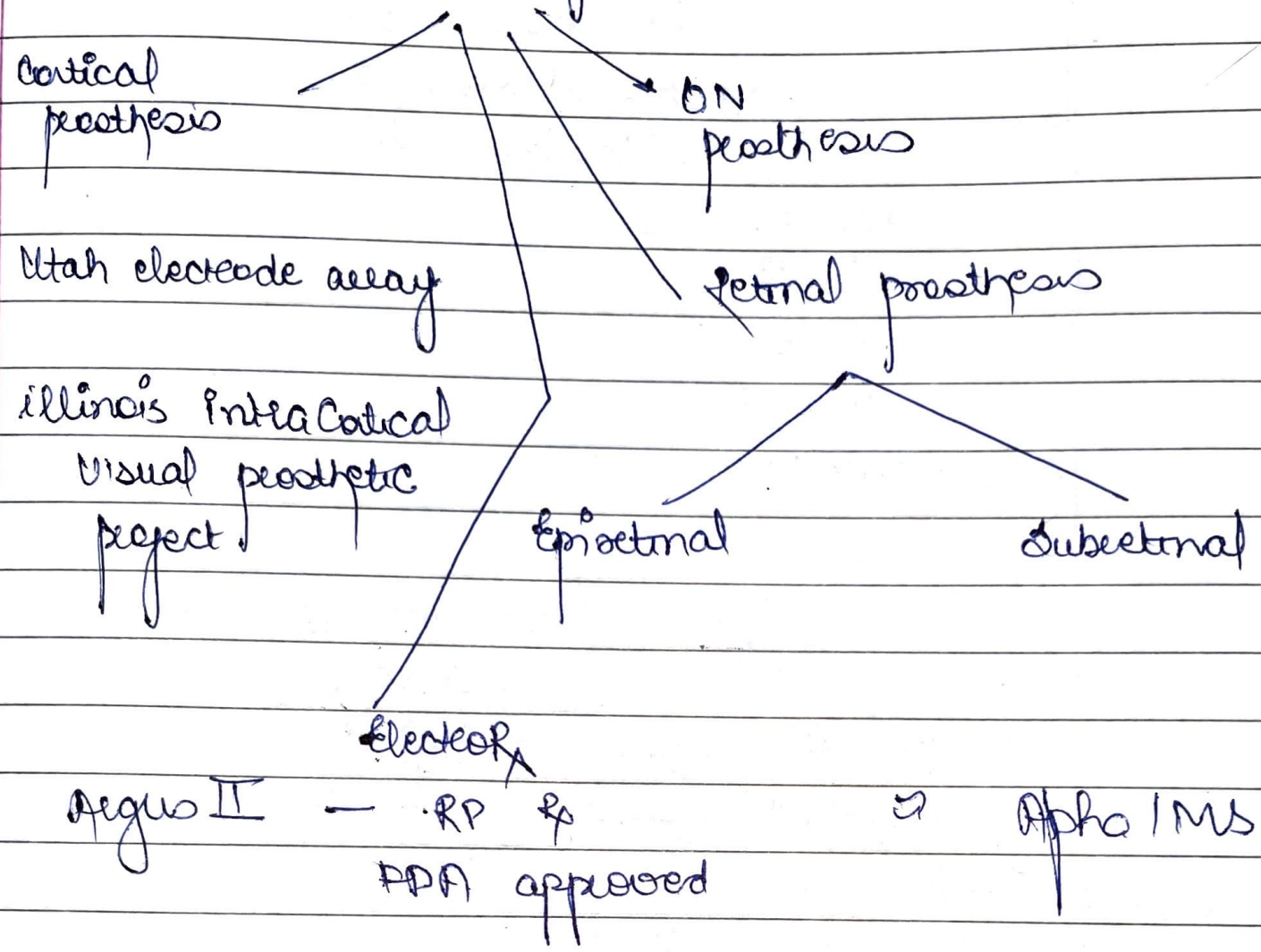
a) FDA approval post Ocular Surgery Inflammation

b) Recalcitrant DME.

fluorinated. Prednisolone.

S.E ↑ IOP

Bionic Eye



- Retinal implant AG
- Pixium Vision SA
- Suprachoroidal wide view implant
  - Bionic Vision Australia

Laser Suture lysis
Adjustable Suture
Releasable "
- Wilson
- Shin's
- Cohen
- Kolka
- Johnstone

Antifibrendytics
Mugs
Glaucoma
- Sussana
- Optimed Glaucoma regulator

NPDS implants
- Absorbable
  - Aquaflow
  - Ex gel
  - Medon gV
- Non abs
  - Tflux
  - Baerveldt
  - Ahmed x
  - Ahmed Hemo wedge

DELTA Pg No.
Date / /

Laser — Excimer — Can
↳ focus optronics
guided
topo (. . .

Sign.

Perimetry

- SITA fast
- Zippy — Zippy estimation of Sequential Threshold (ZEST)
- TOP — Tendency Oriented Perimetry
- FDT

TOP

2nd gen. → Humphrey Matrix

Acuity perimetry { Detection — Optics of eye; Resolution — Density of RGC

High Pass Resolution Perimetry — Motion threshold

Faecbit Perimetry

mVEP, mERG] Objective Perimetry

pattern.

Recent Advances in Cornea

DELTA Pg No.
Date / /

- Imaging
- Any Eye Dx & Rx
- Corneal LASER vision Correction
- Keratoconus Mx
- Surgical Advances
  - Newer Rx
  - future

Imaging
- Tomography
- Biomechanics
- Biomechanics
- Abberometry

- Scheimflug
- Epithelial Mapping
- Corvis ST — Steetchability
  - KC deforms »
- Tomographical Biomechanical Indices (BMI)
  (AI Involved)

(b) • Aberrometry — iTRACE
  - Cornea
  - Lens
  - Brain

OSIRIS-T — Dynamic Aberrometer

(c) - Meibography
- Lipidews

Confocal Microscopy
- Microneuroma — Inflammation
  Vit D levels

Sign.

DELTA Pg No.
Date / /

Hemi DMEK

half moon shaped
2 donor.

Fuch's
Hemi DMEK — cleaved, thinned stroma
EKC - 8,37,64 — Povidone 1%.
+ Dexa 0.1%.

Isotretinoin — may not be c/I for relatives of Rx

DREAM Trial — n3 fatty acid supplementation in dry eye

Post LASIK ectasia — Abn Corneal shape
Younger Age

Choice of Dry Eye Diagnostics — Meibography
Osmolarity
MMP-9.

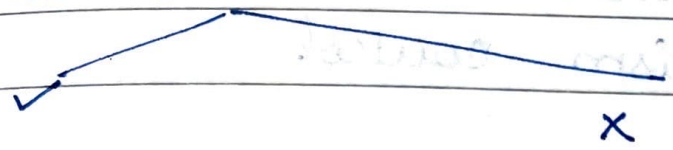
PROSE lens.

Cyclosporin A — 0.09% — Rx of Sicca

Lens / Cataract

DELTA Pg No.
Date / /

- Lepto — Silicon shell — Suction ✓
- Aperture CTC — Steel — X
- CapsuLASER
- miLOOP



- Bisects Cataract
  4m Eq to Eq
  femto — Incomplete chop
- Can be used 4m Scleral tunnel i.e SICS too.

- Phacomix.
- AMD IOL — Pt/AMD
- Small aperture IOL
- Light adjustable IOL 4m Rx Light
- Ri IOL 4m Perfect Lens — femto use
- Fluidvision

Sign.

a) Flacs — ELP ↓HOA by effective centration
∴ Size of Capsulorrhexis
- Lens liquefaction & feagmentation
- High precision in Incisional astigmatism control

(b) Nanosecond laser Cataract Sx — Nd YAG LASER
└ 10% USG power.

(c) IntraOp Aberrometry

(d) Drugs — Omidria — PE + Ketorolac
— Epi Shugarcaine — BSS + Epi + Idocaine
└ Intracameral
— Tri Moxi inj. — 0.2ml intravitreally
└ Dropless Cataract Sx.

1. Istent Inject
2. Hydrus — Corp sparing
3. Stadflo.
4. Cypass Microstent — Suprachoroidal
5. Aqueous Xen — Bypass TM
6. Micro Shunt
7. Kahook Dual Blade
8. TVg → ~~Thermal USG~~ — EyeSonix
   Therapeutic USG for Glaucoma.
9. EyeOR →
10. Hydrogel Sealant — for sealing Wound leak.

Sign.

- Eva Vitrectomy System
- Versa VIT
  Constellation
  Stellaris PC — Chandelier

} Machines

Tools

- 23 G Peag Needle
- Retractable Diamond Dusted
- DualBore SideFlo Canula
- El Rayes Supachoroidal Calipers
- Steerable Laser Probe
- ILM forceps & Eckardt tip &
  Single movable Kamei Suspended
  - Invisible forceps
- Finesse flex loop & 23 gauge
- Hypersonic vitrector
-

Lenses — Single Use Sterile Lenses
Super View Disposable HTC
(Hassan Tornambe Disposable CT)
3D visualization by
Retinal Robotics — Preceyes

My NoteBook

Medical Retina

Imaging | Rx

Imaging

- Wide field imaging — Optos
- Multi Colour
- Wide field OCT
- Hand Held OCT
- Adaptive Optics — PR loss
- OCT / Angio
- Widefield OCTA
- Spectral Imaging

Diabetes

DELTA Pg No.
Date / /

Conbeecept
Abicipar Pegol
Angiopoetin Combination Drugs — RG 7716
Nesvacumab + aflibeecept

Suprachoroidal Cs .

Oculoplastics

Orbital surgeries
- Stereotactic image guidance in orbital Sx

Aesthetic Sx
- Blepharoplasty
- Co2 laser application in conjunction c incisional upper Blepharoplasty
- Combining 2 / Epicanthoplasty & blepharoplasty

Brow lift Sx :- Transblepharoplasty, Endotine fixat"
- Minimal incisions Vertical Endoscopic lifting (MIVEL) Lt Lat
- Small incision frontalis mscl transposition flaps

Blepharoptosis Repair :- Small incision levator advancement & L. aponeurotomy
- Conj. sparing Post Ptosis Sx

Ectropion Repair :- Transposition of Corrugator to supercilli mscl tendon with flap
- Laser Rx of Cicatricial ectropion

My NoteBook
Sign.

Oculoplastics & Aesthetics

Entropion Repair — Lid crease approach to upper eyelid margin rotation
- Hard palate Buccal Mucosal graft.

Stem Cells in Oculoplasty

- Embryonic Stem Cells
- Induced pluripotent stem cells

↓

Lacrimal gland
Orbital fat & Melanocytes
Limbal tissue

Stem Cells Biology —
- Eyelid reconstruction
- LG development
- Tissue Reconstruction after Tx resection
- Cosmetic Procedures

Keratin & Ki67 — resident stem cells of lacrimal gland.

My NoteBook

Sign.

Adipose derived stem cells — 4m Neural Crest

↓

Ocular Surface Reconstruct^{n} & Retinal Dystrophy

↓

can regenerate tissue like Conj & tarsus via programming.

↳ Photo damaged skin rejuvenation

Ocularistry

Ultra thin scleral shell

Hollow Ocular Prosthesis

Painted Conformer

Digital Iris Prosthesis

Rb

DELTA Pg No.
Date / /

Intravitreal → Thiotepa — Melphalan

↓

& Seed morphology

Salt & pepper Retinopathy

- ICG Enhanced TTT — x resp to Chemo.

0.6 mg/kg

↓ laser fluence & irradiance threshold

Direct toxicity

↓

Due to thermal effect

PDT.

- Aq humour sampling for Tx prognostication

MYCN amplification on Chr. 2p.

Liquid bx based on Circulating Tx Cells & cell free DNA (cfDNA) within the blood

Aq H → source of tumour derived cfDNA

6p gain in Aq H may be prognostic" biomarker for poor clinical response to Rx

My NoteBook Sign.

Squint

- CCSS — fMRI — Mech of Amblyopia
- Botulinum toxin
- Nystagmus Rx — Magnetic Implants
- Dichoptic Rx of Amblyopia
- MIS.
- Photoscreening
- Gene Rx
- Plication vs Resection.
- Pivothead glasses for remote evaluation of Strabismus.

Sign.

Neuro-Ophthalmology

7 Tesla MRI — Magnetom tesla

↓

diff b/t white & gray matter.

MS pathology.

MS — OCT Angio

Polarization sensitive OCT

fluorescence labelling

Progressive RNFL] staining

GC IPL.

ON Leg — Ca Channel inhibitor

ION — Intravitreal inj of QPI007.

Remyelinator drugs

Microstents.

DELTA Pg No.
Date

Brachy types

Ext Beam — Particle radiation

Stereotactic