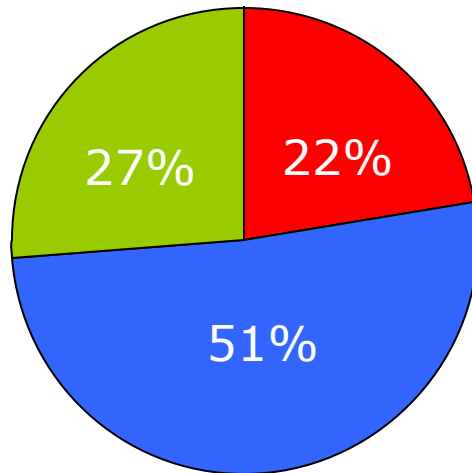


# Who is Plusoptix?

Plusoptix Markets  
in 2010



2001 Company is founded

2006 1<sup>st</sup> generation Vision Screeners

2007 US subsidiary

2008 2<sup>nd</sup> generation Vision Screeners

2009 Latin American subsidiary

2010 3<sup>rd</sup> generation Vision Screeners

2010 Distribution partners in 50 countries

**Market leader in Vision Screening devices**



# Seminar "rules"

- 📌 If you hear something questionable, ask a question!
- 📌 If you hear something remarkable, take a note!
- 📌 Don't waste your time copying slides, they will be available at the Forum web page



# Vision Screening Program Planning

- ☞ Who is already vision screening?
- ☞ What do you expect from this seminar?



# Why is vision screening important?

- ✎ We gather 80% of all information through the eyes
- ✎ We need to see in order to
  - ✎ learn at school
  - ✎ perform in sports and
  - ✎ be safe in traffic
- ✎ We need both eyes for many jobs (e.g police man, truck driver, brick layer)



**To detect vision disorders**

## Why do we screen children?

- ✎ Children need to learn how to see
- ✎ Refraction is changing as eye ball grows
- ✎ Children don't tell about a vision disorder
  - ✎ Vision disorders don't hurt
  - ✎ They think their limited vision is normal
- ✎ Parents can't tell about a vision disorder
  - ✎ There are no symptoms
- ✎ Vision disorders may lead to Amblyopia



**Children don't know about their vision disorder**

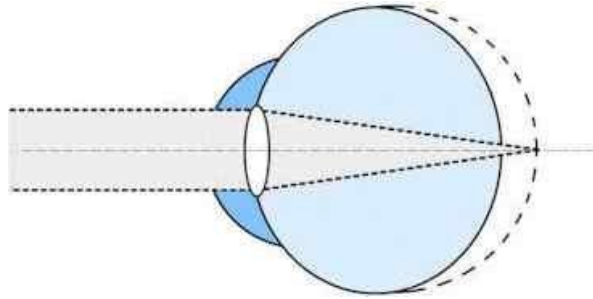
## How do children learn to see?

- ▣ Vision is a joint effort of
  - ▣ the eyes
  - ▣ the optical nerves
  - ▣ the brain
- ▣ The optical nerves need to be trained during the first years of life

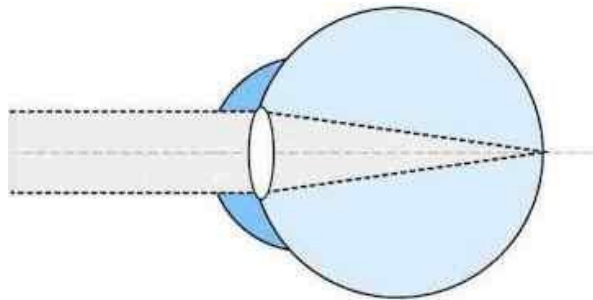


**By training, just like walking and talking**

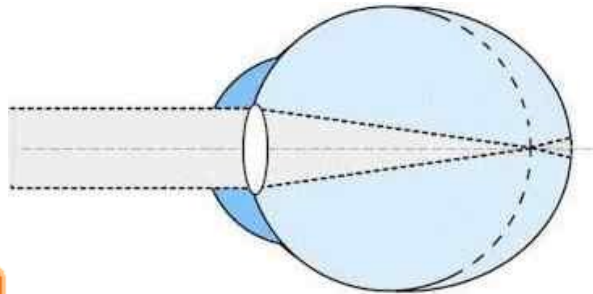
# What happens when the eye ball grows?



At birth the eyeball is short and new born are farsighted, normally



The eyeball grows with ageing and farsightedness disappears



If eyeball keeps growing a child turns short sighted

**Refractive error can occur during growth**



# What is Amblyopia (i.e. lazy eye)?

- ▣ Amblyopia results from vision disorders:
  - ▣ Refractive error
  - ▣ Strabismus (crossed eyes)
  - ▣ Eye diseases
- ▣ Amblyopia can not be treated with glasses or contacts
- ▣ Amblyopia may lead to blindness in one eye
- ▣ Risk to become blind in both eyes is 3x higher



**Only children are at risk to develop Amblyopia**

# How can we prevent Amblyopia?

- ✎ The earlier vision disorders are detected, the better Amblyopia can be prevented
- ✎ Because there are no obvious symptoms, every child needs to be screened
- ✎ Annual vision screening using age appropriate test is considered to be the best way to prevent Amblyopia



**Early detection and treatment of vision disorders produces better visual outcomes**

# How many children have vision disorders?

According to the National Eye Institute:

Prevalence of Amblyopia and vision disorders in US pre-schoolers is high:

- ✎ Amblyopia 2-5%
- ✎ Significant refractive error 10-15%
- ✎ Strabismus 3-4%
- ✎ Eyes diseases  
(not investigated in this study)



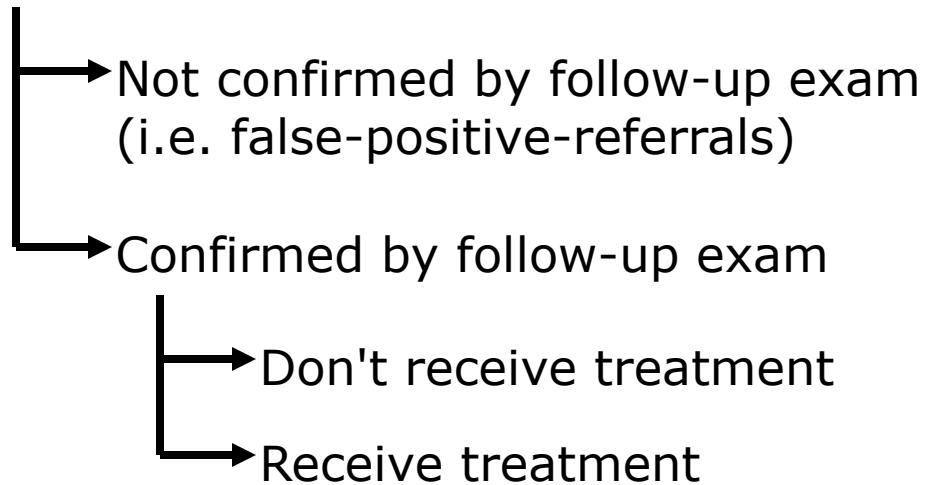
**Vision disorders are the most prevalent handicapping condition in childhood**

# Is Vision Screening all we can do?



→ pass

→ refer



**Successful vision screening =  
screening + follow-up + treatment**

# Summary

- ✎ Children are at risk to develop Amblyopia
- ✎ Amblyopia is a life long vision impairment
- ✎ Children can be screened with age appropriate test only
- ✎ Children's eyes develop as they grow and therefore vision screening needs to be repeated annually
- ✎ Referred children need to be followed-up



**Vision Screening is a program, not an event**

# Challenges to vision screening

- ✎ Funding the program
- ✎ Assuring doctors support
- ✎ Defining a vision screening program
  - ✎ Screening test to be used
  - ✎ Documentation needed
- ✎ Identifying vision screening locations
- ✎ Obtaining a parent consent form
- ✎ Training volunteers
- ✎ Follow-up on referrals



# Vision Screening in Missouri



📄 Tamara Oberbeck



# Vision Screening in Missouri

- ✎ The Missouri Lions vision screening program is unique for having:
  - ✎ Full time vision screening program manager
  - ✎ Full and part time vision screening technicians
  - ✎ Full time follow-up specialist



# Vision Screening in Alaska

PDG Lion John Regan



# Vision Screening in Alaska

- 📄 Innovative medical advisor
- 📄 Vision screenings are performed at Lions Club level
- 📄 Uses 34 Plusoptix Vision Screeners



# How do I perform a measurement?



# Which measurements are taken?

Binocular Patients Settings Instruction manual

**1) Patient data**

Next patient

Surname: Muller

First name: Lieschen

Date of birth: 2008-09-09 Gender: female

ID:

**2) Screening result**

Refer

**3) Documentation**

Measurement report

Label Screenshot

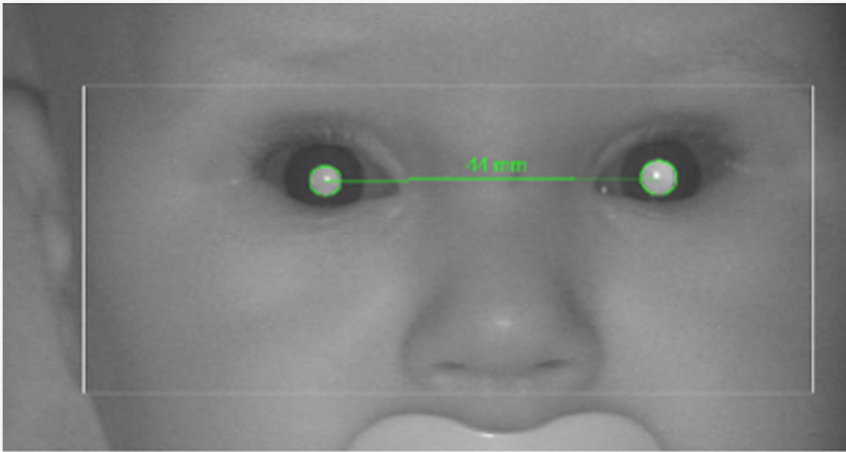
**4) Video control**

Load video Save video

**5) Pay-Per-Use**

Available credits: 425

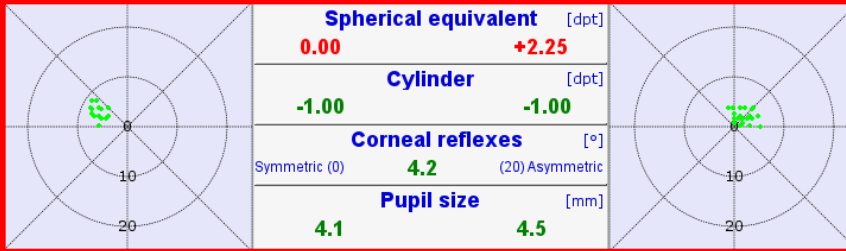
www.plusoptix.eu



**Right eye**

Spherical equivalent [dpt]	
0.00	+2.25
Cylinder [dpt]	
-1.00	-1.00
Corneal reflexes [°]	
Symmetric (0) 4.2	(20) Asymmetric
Pupil size [mm]	
4.1	4.5

**Left eye**



A red arrow points from the right towards the measurement data table.

Spherical equivalent, Cylinder, Corneal reflexes and Pupil sizes are measured

# What are referral criteria?

Binocular Patients Settings Instruction manual

General Printer GDT Referral criteria My address System

Age (month)		Referral criteria					
from	to	Anisometropia	Astigmatism	Myopia	Hyperopia	Anisocoria	Corneal reflex
5	12	1.25	2.00	2.00	3.25	1.0	5.0
12	18	1.00	1.50	1.50	2.00	1.0	5.0
18	30	1.00	1.00	1.25	1.25	1.0	5.0
30	54	1.00	1.00	1.00	1.00	1.0	5.0
54	240	0.75	0.75	1.00	1.00	1.0	5.0

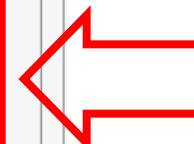
Referral criteria define which measurement values trigger pass / refer screening results.

Anisometropia: Difference of the spherical equivalents\* of both eyes  
Astigmatism: Cylinder value  
Hyperopia: Spherical equivalent\* for hyperopia  
Myopia: Spherical equivalent\* for myopia  
Anisocoria: Difference of the pupil diameters of both eyes  
Asymmetry: Asymmetry of the corneal reflexes of both eyes

The measured values result in a „Refer“, when they are equal or larger to the entered referral criteria.

You can edit and save age groups and referral criteria, by entering a new value into a box in the table and confirming it afterwards by pressing „Enter“. Is one age group line tagged and you press Delete on your keyboard, the tagged age group will be deleted.

\* See instruction manual



**Referral criteria are age depending thresholds that measurements are compared to**

# What is a screening result?

Binocular Patients Settings Instruction manual

**1) Patient data**

Next patient

Surname: Muller

First name: Lieschen

Date of birth: 2008-09-09 Gender: female

ID:

**2) Screening result**

**Refer**

**3) Documentation**

Measurement report

Label Screenshot

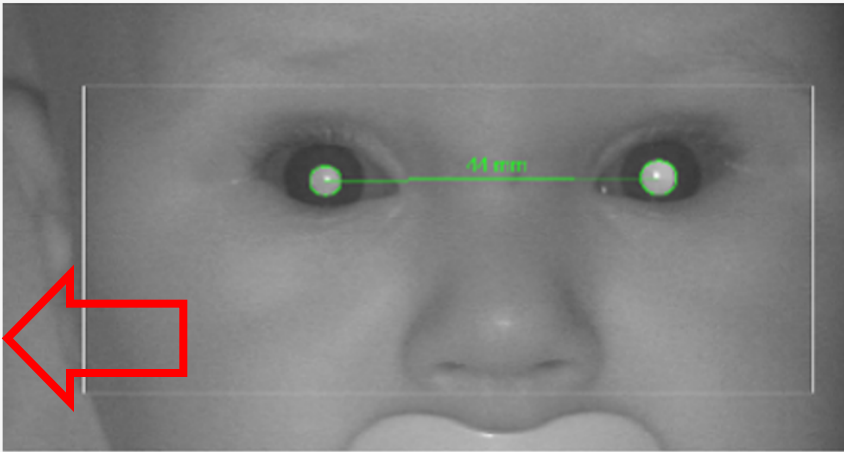
**4) Video control**

Load video Save video

**5) Pay-Per-Use**

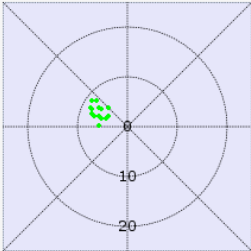
Available credits: 425

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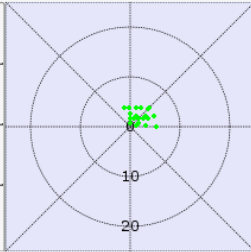


**Right eye**

Spherical equivalent [dpt]	
0.00	+2.25
Cylinder [dpt]	
-1.00	-1.00
Corneal reflexes [°]	
Symmetric (0) 4.2	(20) Asymmetric
Pupil size [mm]	
4.1	4.5

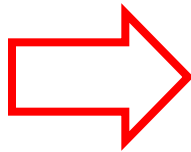


**Left eye**



A "pass" or "refer" screening result is displayed immediately

# What is a measurement report?



**Anchorage  
Knights  
of the Blind  
Lions Club**

**Customize this column  
with your logo and  
contact information!**

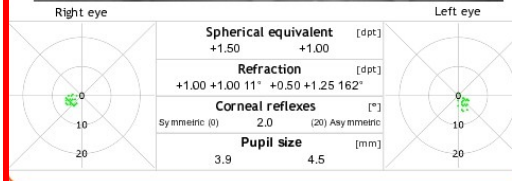
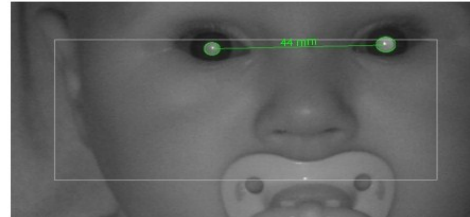
Vision Screener  
plusoptix S09  
provided by  
a generous grant  
from



Mercedes-Benz

## Vision Screening Result

Surname: Smith  
First name: Jasmin  
Date of birth: 01.01.2010  
Date of measurement: 01.07.2011



Referral criteria		Refer
Anisometropia	Spherical equivalent $\geq 1.00$ dpt	<input type="button" value="No"/>
Astigmatism	Cylinder $\geq 1.00$ dpt	<input type="button" value="Yes"/>
Hyperopia	Spherical equivalent $\geq 1.25$ dpt	<input type="button" value="Yes"/>
Myopia	Spherical equivalent $\geq 1.25$ dpt	<input type="button" value="No"/>
Corneal reflexes	Asymmetry $\geq 5.0$ °	<input type="button" value="No"/>
Anisocoria	Pupil size $\geq 1.0$ mm	<input type="button" value="No"/>

This measurement is part of an eye exam. Vision Screening does not replace a complete eye examination by an ophthalmologist or optometrist. Vision Screening must be conducted regularly as eyes may change over time.

Screening performed at:  
Anchorage Knights of the Blind Lions Club  
Provide your  
contact information  
here!

[www.plusoptix.eu](http://www.plusoptix.eu)

**Refer**

**You are able to edit the advertisement column!**



# Where do I get more information?

- 📄 USA & Canada (office in Atlanta/Georgia)  
Cindy McDowell  
c.mcdowell@plusoptix.com
- 📄 Latin America (office in Bogota/Colombia)  
Fernando Conde  
f.conde@plusoptix.com
- 📄 Other countries (office in Nuernberg/Germany)  
Christian Schmidt  
c.schmidt@plusoptix.com



**Visit us at our booth**

# How compares Plusoptix to MTI?

	Screening result = pass	Screening result = refer	
Infant has a vision disorder	<b>0.275%</b> (i.e. false-negative-rate = 1.1%)	<b>24.725%</b> (i.e. sensitivity = 98.9%)	<b>25%</b> prevalence of vision disorder
Infant has no vision disorder	<b>72.075%</b> (i.e. specificity = 96.1%)	<b>2.925%</b> (i.e. false-positive-rate = 3.9%)	<b>75%</b> number of healthy infants
	<b>72.35%</b> number of "passed" infants	<b>27.65%</b> number of "referred" infants	<b>100%</b> total number of infants



**Sensitivity: How many of all infants with a vision disorder are referred?**

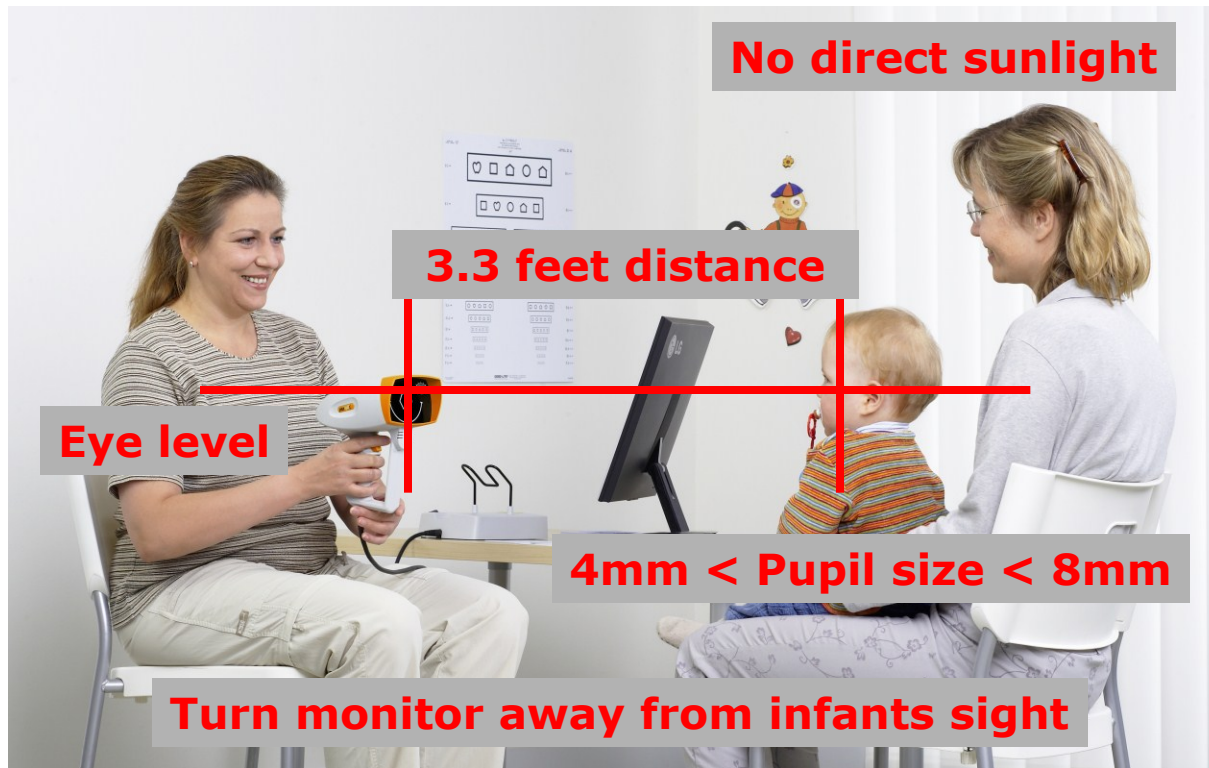
**Here: 20% / 25% = 80%**

# How compares Plusoptix to MTI?

	Screening result = pass	Screening result = refer	
Infant has a vision disorder	false-negative-rate Pluso: 1.1% MTI: 16.4%	Sensitivity Pluso: 98.9% MTI: 83.6%	prevalence of vision disorder
Infant has no vision disorder	Specificity Pluso: 96.1% MTI: 90.5	false-positive-rate Pluso: 3.9% MTI: 9.5%	number of healthy infants
	Total number of "passed" infants	Total number of "referred" infants	total number of infants



# What do I need to pay attention to?



**Avoid distractions,  
both eyes need to align to camera**

# What are status messages?

Binocular Patients Settings Instruction manual

**1) Patient data**

Next patient

Surname  
Miller

First name  
Lucy

Date of birth 2009-01-02 Gender female

ID

**2) Screening result**

Refer

**3) Documentation**

Measurement report

Label Screenshot

**4) Video control**

⏮ ⏪ ⏩ ⏭

Load video Save video

**5) Pay-Per-Use**

Available credits: **425**


www.plusoptix.eu

**Status messages are:**

- ✖ Pupils not found
- ✖ Pupil too large
- ✖ Pupil too small
- ✖ Infrared noise
- ✖ Measurement out of range

**Measurement out of range**

Right eye		Left eye	
<b>Spherical equivalent</b> [dpt]		<b>Spherical equivalent</b> [dpt]	
<b>Myopia</b>	<b>Myopia</b>	<b>Myopia</b>	<b>Myopia</b>
<b>Cylinder</b> [dpt]		<b>Cylinder</b> [dpt]	
<b>Myopia</b>	<b>Myopia</b>	<b>Myopia</b>	<b>Myopia</b>
<b>Corneal reflexes</b> [°]		<b>Corneal reflexes</b> [°]	
Symmetric (0)	<b>1.9</b>	(20) Asymmetric	
<b>Pupil size</b> [mm]		<b>Pupil size</b> [mm]	
<b>5.8</b>	<b>5.8</b>		



**Status messages help you identify the reason of an inconclusive screening result**

# What's the meaning of referral criteria?

- ✎ **Anisometropia**  
compares refraction of both eyes
- ✎ **Astigmatism**  
checks corneal curvature
- ✎ **Myopia**  
checks nearsightedness
- ✎ **Hyperopia**  
checks farsightedness
- ✎ **Anisocoria**  
compares pupil sizes of both eyes
- ✎ **Corneal reflexes**  
checks symmetric eye alignment



# What are documentation options?

- ✎ plusoptiX S09 can be connected to an EMR system to import patient data and export readings automatically
- ✎ plusoptiX S09 can be connected to printers for paper record documents
- ✎ Three printouts are available
  - ✎ Self adhesive label (readings only)
  - ✎ Screenshot (readings and picture)
  - ✎ Measurement report (giveaway for parents)

**All printouts can be saved as PDF-files, too**

