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Massachusetts Preschool Vision Screening Program: Two Year Program Evaluation
Massachusetts Preschool Vision Screening Program:
Two Year Program Evaluation

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Preschool Vision Screening Discussion Summary

- **Background Information**
  - Massachusetts legislative mandate
  - Massachusetts preschool vision screening protocol
  - Strategic model for preschool vision screening program
  - Implementation activities

- **Massachusetts program**
  - Evaluation activities
  - Evaluation results
    - Percent kindergarteners receiving preschool vision screening
    - Quality of preschool vision screening: PCPs and school nurses
    - Percent failed screenings receiving follow-up with eye professional

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MA Preschool Vision Screening
Legislative Mandate: MGLc71s57

- Signed into law July 15, 2004
- Requires proof of vision screening within 12 months prior to entering kindergarten
  - Approved personnel
  - Approved vision screening protocol
- Requires documentation of comprehensive eye examination:
  - Children who not pass vision screening
  - Children who are diagnosed with neuro-developmental delay
Massachusetts Preschool Vision Screening Program

Vision Screening Protocol
MA Preschool Vision Screening
Visual Acuity Protocol

Mass VAT: Lea symbols

Mass VAT: HOTV letters

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MA Preschool Vision Screening
Visual Acuity Protocol

- Specific instructions give for monocular occlusion
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Stereo Testing Protocol

- Random Dot E
  - three cards
  - stereo glasses
Massachusetts Preschool Vision Screening Program

Logic Model
MA Preschool Vision Screening Program Strategic Model

- Program based on “medical home”: All children to receive vision screening at primary care provider’s office
  - 95% MA children have health insurance and primary care provider
  - School nurses play critical role as a “safety net”, to capture children upon entry into kindergarten
  - Value of serial vision screenings well recognized (AAP, AAO guidelines)
MA Preschool Vision Screening Program: Logic Model

PCPs unaware and unfunded

If we effectively educate PCPs in order to increase awareness and change behavior

If PCPs do screening in medical home

If all preschool children have a vision screening

If all positive screenings have follow-up and treatment

Prevalence of amblyopia decreases
Reduce disability from vision loss

Education Activities

Environment Activities
Reimbursement
Quality measures
Legislative mandate

Environm ent Activities
Parent/caregiver education

INITIAL OUTCOME
INTERMEDIATE OUTCOME
LONG TERM OUTCOME

School Nurses*
Direct Care Evaluation Activities

Evaluation Activities

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Implementation
MA Preschool Vision Screening Education Materials

- Powerpoint training presentation
- Vision screening video
  - video web site: http://www.ace.neu.edu/shi/links.php
- Written protocols, new physical exam forms
- Massachusetts Department of Public Health web site: www.mass.gov/dph/fch/schoolhealth
- MA Preschool Vision Screening CD
  - Alcon Laboratories
  - Massachusetts Medical Society

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MA Preschool Vision Screening Education Activities

- Pedi Primary Care Providers
  - Two mass mailings (‘05, ‘07)
  - CME conferences
  - Hospital Grand Rounds
  - Professional newsletters (MA Chapters of AAP, AAFP) list serves, web sites
  - Office instructional CD
  - Hot line number
MA Preschool Vision Screening Education Activities

- School Nurses
  - CD mailing (‘07)
- School Health Institute
  - On-going conferences, workshops
  - Train-the-Trainer
- Professional newsletters, list serves, web sites
- Hot line number

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Massachusetts Preschool Vision Screening Program

Unit of Observation: Primary Care Providers
MA Preschool Vision Screening Phone Survey

- Randomized phone survey, August-September 2006
  - Eighteen months after initial educational initiative
  - One hundred primary care pediatric practices
  - Ninety nine percent (90%) were aware of the new mandated preschool vision screening program
  - Eighty nine percent (89%) were implementing the new protocol in their offices
Preschool Vision Screening Questionnaire: 2005

- Baseline mail survey of pediatric healthcare providers
- Four hundred ninety one (491) pediatric healthcare provider respondents
- Data based on 302 respondents who reported that at least 75% of practice involved pediatric patients
Preschool Vision Screening Questionnaire: 2007

- Follow-up mail survey of pediatric primary care providers
- Questions similar to base line 2005 survey
- One hundred thirty (130) respondents
- Data based on 91 respondents who reported that at least 75% of practice involved pediatric primary care practice
  - 70% private group practice, 14% private solo practice
  - 7% hospital based, 6% community health center
  - 81% 11+ years in practice
73% of respondents reported using the new Massachusetts Preschool Vision Screening Protocol.
Visual Acuity Tests: HOTV or Lea Symbols

Percent of providers who use HOTV or Lea symbols for visual acuity testing, by age and year

- 2005: 3-5 yr olds
- 2007: 3 yr olds
- 2007: 4 yr olds
- 2007: 5 yr olds
Visual Acuity Tests: Pictures

Percent of pediatric providers who use pictures for visual acuity testing, by age and year

- 2005: 3-5 yr olds - 73%
- 2007: 3 yr olds - 52%
- 2007: 4 yr olds - 43%
- 2007: 5 yr olds - 26%

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Alignment Tests: Stereo Test

Percent of pediatric providers who use stereo test for alignment testing, by age and year

- 2005: 3-5 yr olds
- 2007: 3 yr olds
- 2007: 4 yr olds
- 2007: 5 yr olds

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Visual Acuity Tests: Method of Occluding Eye

Percent of providers who occlude eye by using hands or plastic/cardboard cover, by age and year

- 2005: 3-5 year olds
- 2007: 3 year olds
- 2007: 4 year olds
- 2007: 5 year olds

Fingers/hands
Plastic/cardboard cover

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Visual Acuity Tests: Method of Occluding Eye

Percent of providers who occlude eye by using patch/tape or occluder glasses, by age and year

- 2005: 3-5 yr olds
- 2007: 3 yr olds
- 2007: 4 yr olds
- 2007: 5 yr olds

% of providers

- Patch/tape
- Occluder glasses

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Visual Acuity Tests: HOTV & Lea Symbols

Percent of respondents who use HOTV or Lea symbols for visual acuity testing in 3-5 year olds

- 2005: 18%
- 2007: 65%

$X^2 = 75.3, df=1, p<.001$

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Proportion of respondents who used patch, tape, or occluder glasses when assessing visual acuity in 3-5 year olds, by year

X² = 32.7, df=1, p<.001

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Preschool Vision: Alignment

Percent of primary care providers whose preschool vision screening protocol for 3-5 year olds includes an assessment of alignment

66% 92%

X² = 29.5, df=2, p<.001

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Percent of respondents who used stereo testing as a method of assessing alignment in 3-5 year olds, by year

- 2005: 15%
- 2007: 85%

χ² = 122.1, df=1, p<.001

Alignment Tests: Stereo Test

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PCP Survey Conclusions

- Significant increase in number of PCPs using MA Preschool Vision Screening Protocol:
  - Acuity: HOTV and Lea symbols (18% to 65%)
  - Acuity: Pictures
  - Alignment testing (66% to 92%): stereo test (15% to 85%)
  - Method of occlusion: glasses and patch (11% and 65%)
- Large number continue to use inappropriate methods of occlusion: palm of hand, cover
PCP Survey Limitations

- Small sample size for 2007
- Not random sample
- Selection bias
- Results suggest a sample which may be LESS compliant with the recommendations, compared with the randomized sample in the phone survey
Massachusetts Preschool Vision Screening Program

Evaluation
Unit of Observation: School Nurses
2005-2006 School Nurse Survey

Percent of kindergarteners with documentation of preschool vision screening

Total kindergarten students reported: 29,811
Data collected by Massachusetts Department of Public Health

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2006-2007 School Nurse Survey (April 2007)

Percent of kindergarteners with documentation of vision screening, by source

Total kindergarten students reported: 31,031 (45% of total enrollment of 68,585)

Data collected by on-line questionnaire, reaching 85% MA schools, public and non-public, administered by MA Medical Foundation

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Total K reported: 22,432 (33%) of total K enrollment of 68,585.
Total screened: 16,512 (73.6% of reported kindergarteners)

Data collected by on-line questionnaire, reaching 85% MA schools, public and non-public.
Report of school nurse respondents on symbols used to assess visual acuity on children entering kindergarten most of the time.

Data collected by on-line questionnaire, reaching 85% MA schools, public and non-public.

Symbols used to assess visual acuity

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Report of school nurse respondents on method used to occlude the eye when screening children entering kindergarten

Method of occlusion

Data collected by on-line questionnaire, reaching 85% MA schools, public and non-public.

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Report of school nurse respondents on time to complete preschool vision screening on a child entering kindergarten

Categories of time, in minutes

1-3 minutes: 14.6%
4-6 minutes: 59.5%
7-9 minutes: 16.3%
10 or more minutes: 9.6%

Data collected by on-line questionnaire, reaching 85% MA schools, public and non-public.

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2007-2008 School Year Survey (Oct-Nov 2007)

- 89% rated preschool vision screening as important or extremely important
- 65% reported that both visual acuity and stereopsis are recorded on the physical exam form at least half the time
  - More than half of the respondent nurses NEVER contact the pediatrician’s office when the screening is not completed accurately
- 44.1% reported that eye care providers almost always or always communicate results from the eye examination

Data collected by on-line questionnaire, reaching 85% MA schools, public and non-public.
2007 Ongoing Survey Results

- 8.3% (1275) of those screened did not pass
  - 63.8% (813) did not pass the acuity section
  - 49.7% (633) did not pass the stereo section
  - 27.9% presented comprehensive eye examination (October 2007)

Data collected by on-line questionnaire, reaching 85% MA schools, public and non-public.

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Continuous Quality Improvement (CQI) Vision Screening Project

- Self selecting cohort of nurse leaders for 2006-2007 school year
- Provides information on referral and follow-up rates
Continuous Quality Improvement (CQI) Vision Screening Project

- Report on 10,868 enrolled kindergarten students
- 51.7% (5,626) presented with documentation of completed preschool vision screening by PCP
  - 61.3% of these had stereopsis screening documented
Continuous Quality Improvement (CQI) Vision Screening Project

- Report on 4,073 Pre-K students (16.9% of total PreK enrollment of 24,073)
  - 2681 (65.6%) were screened initially
  - 11% PreK students referred for failed vision screening
    - 76.4% of those referred had a comprehensive eye examination
  - 2% referred for developmental delay
Continuous Quality Improvement (CQI) Vision Screening Project

- Report on 14,091 Kindergarten students
  - 11,725 (83.2%) were screened initially
  - 9.8% Kindergarten students referred for failed vision screening
    - 63.9% of those referred had a comprehensive eye examination
    - 68.2% confirmed a vision issue
  - 0.5% referred for developmental delay
School Nurse Surveys: Conclusion

- Increase in the number of preschoolers screened by PCP since 2005: 43.9% to 61.8%
- Quality of school nurse screening:
  - Acuity symbols: 87.1% respondents use Lea and HOTV
  - Occlusion: 55.7% respondents use occluder glasses and patch
- Comprehensive eye examination (CEE)/follow-up:
  - CQI data: 63.9% and 76.4% completed referral
  - Online survey: 27.9% CEE at October 2007
MA Preschool Vision Screening Program: Conclusion

- Increase in rates of preschool vision screening documentation
- Improvement in quality of vision screening: PCP and school nurse
- Baseline data for follow-up
- Areas for concern:
  - Methodology: ocular occlusion
  - Communication with PCP
MA Preschool Vision Screening Program: Moving Forward

- Continue aggressive professional education campaign:
  - Primary care providers and school nurses

- Continue process of program evaluation:
  - Multiple sites
  - PCP and school nurse

- Develop unified system to record data and track failed screenings
MA Preschool Vision Screening
Moving Forward: Environment Activities

- Develop methods for funding vision screening
  - Insurer reimbursement in the medical home
  - Legislative mandate: bill filed
MA Preschool Vision Screening Program: Logic Model

**If we effectively educate PCPs in order to increase awareness and change behavior**

**PCPs unaware and unfunded**

*Environment Activities*
- Reimbursement
- Quality measures
- Legislative mandate

If PCPs do screening in medical home

If all preschool children have a vision screening

If all positive screenings have follow-up and treatment

Prevalence of amblyopia decreases

Reduce disability from vision loss

**INITIAL OUTCOME**

**INTERMEDIATE OUTCOME**

**LONG TERM OUTCOME**

**School Nurses***

Direct Care
Evaluation Activities

**Education Activities**

**Reimbursement**

**Quality measures**

**Legislative mandate**

**Parent/caregiver education**

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MA Preschool Vision Screening
Moving Forward: Environment Activities

- Develop Health Literacy / Consumer Engagement Campaign
  - Target audience: parents and caretakers
  - Media campaign
    - T.V., radio, print
    - Public service announcement (PSA)
  - Investigate collaborative possibilities
Kids deserve it!

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Thank you
End