210: Innovative Approaches to Improving Asthma Control

Moderator: Stanley J. SZEFLER, MD

A Clinic-Based Program Using a 3-Visit Model of Assessment, Tailored Treatment, and Education in Italy

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AAAAI American Academy of Allergy Asthma & Immunology

VIRTUAL ANNUAL MEETING

FEBRUARY 26–MARCH 1, 2021

Incorporating New and Emerging Therapies Into Allergy/Immunology Practice and Research

#AAAAI21

Outline

- Background
- Developing the « IoeAsma» Project
- Going beyond asthma management: approaching health promotion with lifestyles
- Conclusions

BACKGROUND

- Pediatric Asthma Guidelines have been published since many years and regularly updated

- YET Management of asthma is not adequate :

➢ Delay in diagnosis is a daily finding

➢ Lack of adherence to asthma management is constantly reported (e.g. therapy modulation, proper use of drugs, …)

➢ Too many E.R. asthma accesses in children still recorded world-wide

URGENT NEED FOR IMPROVEMENT

The « IOEASMA « Project

Aim of the project

- To investigate pitfalls and barriers in implementing asthma guidelines in children in Italy, namely in Brescia metropolitan area in Lombardy (> 1 Million inhabitants)

- To evaluate strategy and tools to facilitate implementation and improvement of pediatric asthma management

Objectives

- Harmonizing management of pediatric asthma across health professionals (pediatricians and primary care practitioners) and at the community level

- Reducing asthma exacerbations and access to the E.R.

Strategic plan

1 - Establishing a multidisciplinary **working group** with HCP (pediatric allergists, nurses, primary care and emergency physicians) pharmacists, teachers, pedagogists and a communication expert.

2 - **Tools Building & Dissemination** across the stakeholders:
face to face courses to HCP and at schools

3 - Consolidating a Diagnostic Therapeutic Educational Pathway (**DTEP**)
&
Establishing a dedicated **Asthma Center** «IOEASMA»

Tools Building & Dissemination

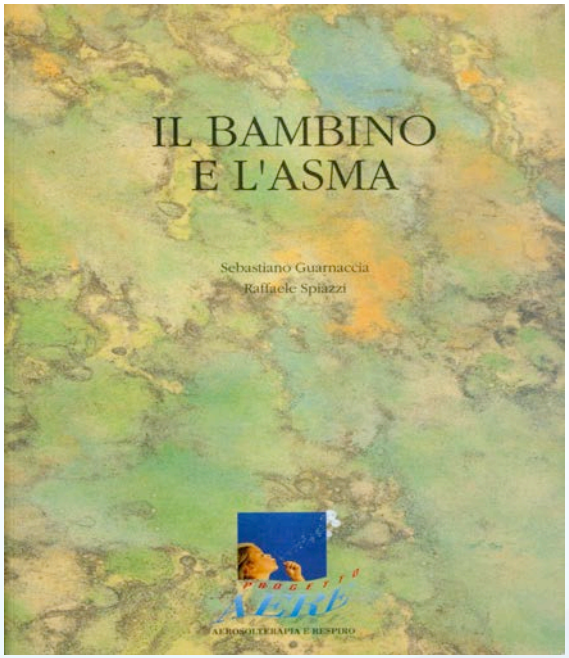
- Booklets: «THE CHILD AND ASTHMA» for children, families, school
- Local guidelines : adaptation of International Guidelines to the local context
- CDs for HCP: including local guidelines for asthma Dx, Rx of acute episodes, long term management and prevention of recurrences
- Website: with dedicated areas for HCP, patients and families
- DATABASE: integrated to DTEP

Tools Building & Dissemination

- Booklets: «THE CHILD AND ASTHMA» for children, families, teachers
- Local guidelines : adaptation of International Guidelines to the local context
- CD for Health Care Professionals HCP : including local guidelines for : diagnosis of asthma , treatment of acute episodes, long term management and prevention of recurrences
- Website with dedicated areas for health professionals , patients and families

EXPLAINING ASTHMA TO A CHILD… CAN BE CHILD'S GAME?

ATS - 2000, Toronto



1. PERSONALISED AND INTERACTIVE BOOK

DELIVERED AND EXPLAINED TO THE CHILD

BY THE FAMILY PAEDIATRICIANS

THREE INTERACTIVE SECTIONS:

- **CHILD**
- **PARENTS**
- **TEACHERS, HCP, NURSES**

2. BOOKLET FOR PARENTS, TEACHERS, NURSES

WITH INFORMATION AND EXPLANATION ON:

- **WHAT IS ASTHMA?**
- **ITS PREVENTION**
- **TREATMENT**
- **MANAGEMENT (HOME-SCHOOL)**

Booklet implementation

WORKING GROUP PROJECT

STEP 1- AT HOSPITAL

- PEDIATRIC ALLERGIC PATIENTS DRAWING THEIR DISEASE AT CLINIC
- OUTPATIENTS DAILY MEETINGS
- PRIMARY SCHOOL MEETINGS
- HOSPITAL MEETINGS WITH PHYSICIANS, NURSES, TEACHERS, SPORT PERSONALITIES

STEP 2- AT SCHOOL

MEETINGS WITH:
PARENTAL GROUPS, PSYCHOLOGISTS,
NURSES, TEACHERS, FAMILY PAEDIATRICIANS,
NATIONAL AND INTERNATIONAL SPECIALISTS

EDUCATIONAL TRAINING COURSE AT SCHOOL – 1

- **INVOLVEMENT**

  - LOCAL HEALTH AUTHORITY

  - PRIMARY SCHOOL

- **TRAINING PROGRAMME staff: 2 Paediatricians (Allergist, Pulmonologist) 1 Epidemiologist cartoonist, 1 Testimonial (Athlete with Asthma) 5 Pediatric Allergy Residents**

Aim of the Course

- **IMPROVE KNOWLEDGE OF ASTHMA**
- **ELIMINATE FEAR AND FAVOUR POSITIVE ATTITUDE**
- **GIVE A BETTER UNDERSTANDING OF THE PHYSICAL PERFORMANCES OF ASTHMATIC CHILDREN**

Course Agenda

- **Three 2-hour meetings**
- **32 primary SCHOOL TEACHERS**
- **QUESTIONNAIRES delivered at the BEGINNING and at the END of the COURSE**

EDUCATIONAL TRAINING COURSE AT SCHOOL – 2




CONTENTs

what is asthma? what happens during an asthma attack?

asthma trigger factors? how do you treat an asthmatic attack?

physical activity & sport,

premedication treatment & correct use of asthma devices (aerosol, spacers, PFM)

OUTCOME OF THE PRE-POST QUESTIONNAIRE

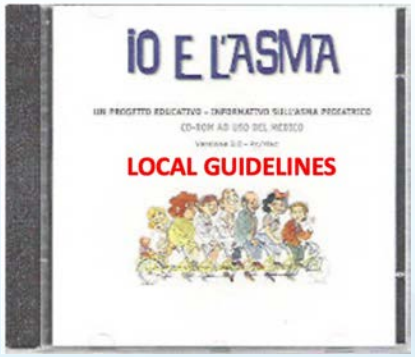
remarkable increase in knowledge by teachers

correct answers improved from 63% (beginning) to 81% (end of the course)

Tools Building & Dissemination

- Booklets THE CHILD AND ASTHMA for children , families , school
- Local guidelines (adaptation of GINA Guidelines)

&



CD for HCP: **Asthma Prevention, Dx, Rx, educational charts and Link to website**

- Website with dedicated areas for health professionals , patients and families

The Educational CD Tools

Tools Building & Dissemination

- Booklets THE CHILD AND ASTHMA for children , families , school
- Local guidelines : adaptation of International Guidelines to the local context
- CD for Health Care Professionals HCP : including local guidelines for : diagnosis of asthma , treatment of acute episodes, long term management and prevention of recurrences

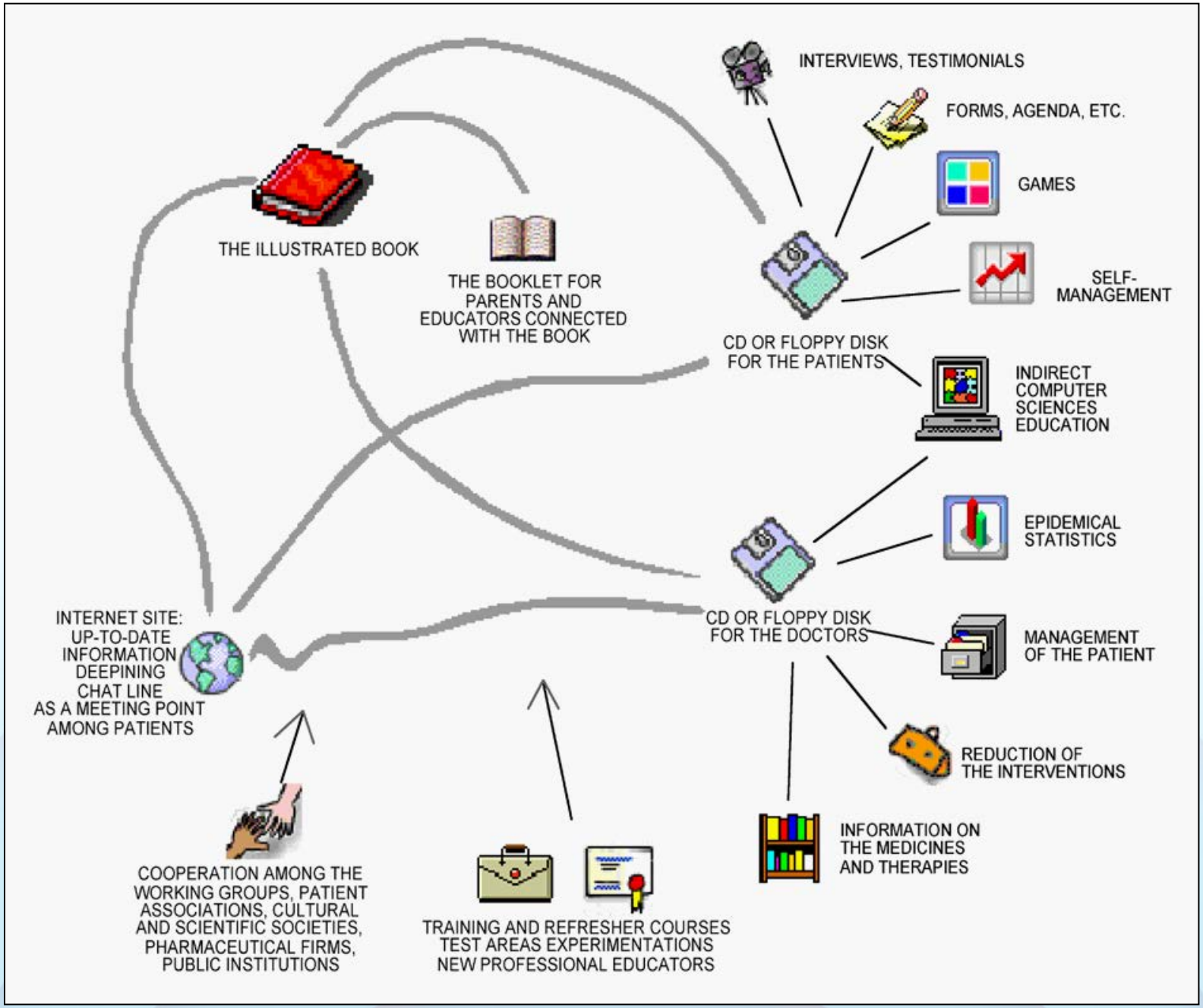
Website with dedicated areas for HCP, patients and families

WEBSITE: ASTHMA AND ME (www.ioeasma.it)

IT IS A PROJECT BASED ON MULTIMEDIA, INTERACTIVE CONTINUOUS EDUCATION AND ITS IMPLEMENTATION, TO IMPROVE HEALTH OUTCOMES.

WEBSITE AREAS: 1) HCP 2) teachers 3) pharmacists, 4) parents and children

ASTHMA AND ME: THE PROJECT MAP



IOEASMA project: RESULTS

Figure 2. Variation in the classification of asthma severity from the first visit to the last follow-up available for each patient.

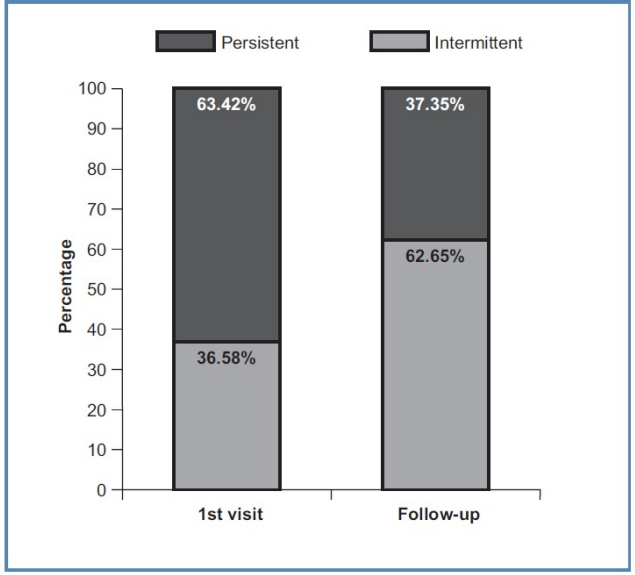
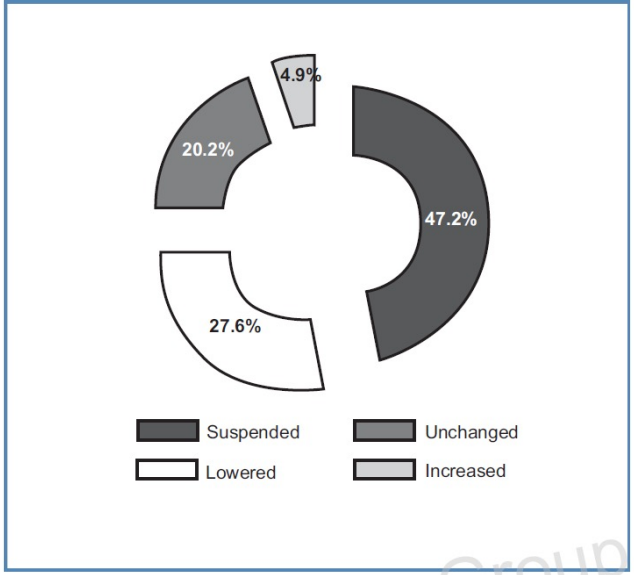


Figure 3. Variation in the treatment (drug and dose of controllers) used by the patients to achieve control of asthma-related symptoms over the study period.



- **179 PRIMARY CARE physicians**: 94.6 % followed Local Guidelines
- **264 children** followed for 10 mos, 98.6% of children learned to manage exacerbations
- 50% patients with persistent symptoms reverted to intermittent symptoms
- Maintenance Rx was suspended in 47.2%, reduced in 27.6%, and increased in 4.9%.

Asthma severity reduced significantly ($p<0.0001$) and requirement of drgus for exacerbations was significantly reduced ($p<0.0001$).

Guarnaccia S et al, Primary Care Respiratory Journal 2007

Primary Care Respiratory Journal (2007); 16(6): 357-362

Primary Care
RESPIRATORY JOURNAL
www.thepcrj.org

ORIGINAL RESEARCH

Application and implementation of the GINA asthma guidelines by specialist and primary care physicians: a longitudinal follow-up study on 264 children

***Sebastiano Guarnaccia[a], Andrea Lombardi[a], Alessandro Gaffurini[a], Mariateresa Chiarini[a], Serena Domenighini[a], Emanuele D'Agata[a], Richard Fabian Schumacher[b], Raffaele Spiazzi[a,b], Luigi D Notarangelo[b,c]**

[a] Laboratorio Clinico-Pedagogico e Ricerca Biomedica, Ospedale dei Bambini, Brescia, Italy
[b] University Children's Hospital, Spedali Civili, Brescia, Italy
[c] Children's Hospital, Harvard University, Boston, MA, USA

Received 19th March 2007; accepted 28th July 2007

Conclusion

An integrated and structured diagnostic and therapeutic management protocol consistent with the recommendations of the GINA international guideline adapted to local context and supported by new technologies, has been shown to reduce significantly the impact of asthma and to improve the quality of life of children, their families and participating physicians.

Strategic plan

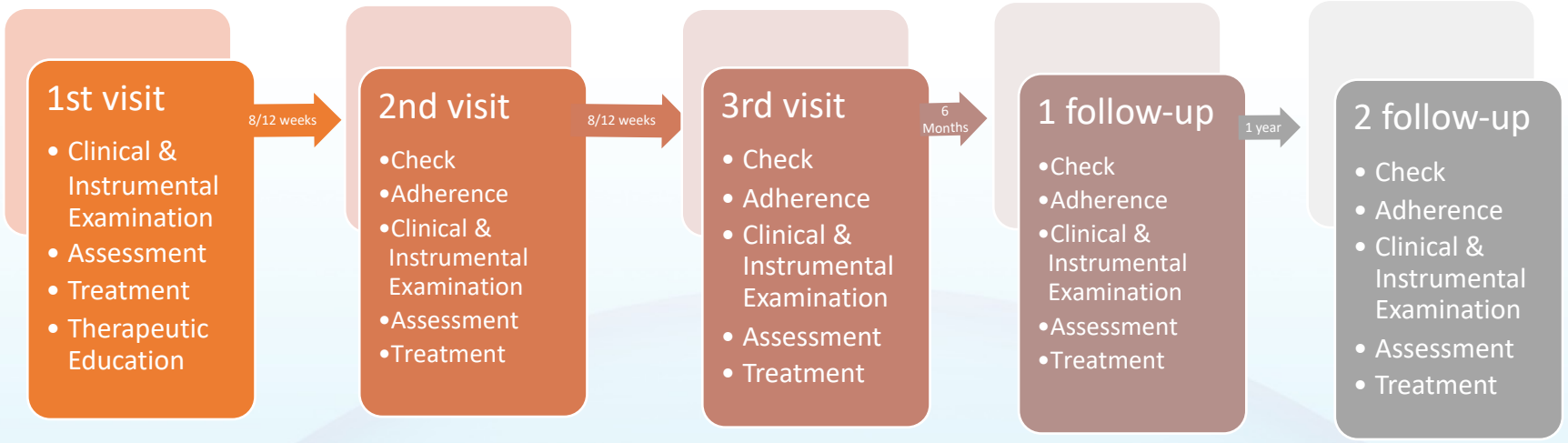
1- **Establishing** a multidisciplinary working group with health care professionals (pediatric allergists , nurses, primary care , emergency physicians) pharmacists , teacher , pedagogists and a communication expert

2- **Building tools & Dissemination** tools across the stakeholders : face to face course to HCP (physicians , pharmacists) and school

3 - **Consolidating DTEP for pediatric asthma patients & Establishing a dedicated Asthma Center «IOEASMA»**

Diagnostic Therapeutic Educational Pathway (DTEP)

Guideline → THERAPEUTIC EDUCATION → Chronic Care Model → Leaflet → ioeasma.it



The DTEP includes **three specialist's evaluations** at the Center **over 6 months** and **two follow up visits** after 6 months and 12 months

After each specialist evaluation, the patient continues the follow up with the family doctor, who verifies the adherence to the DTEP.

Guarnaccia S et al Pneumol Ped 2017

What is Therapeutic Education (TE)

Complex and continuous process, integrated with care, which helps physicians to improve patient health in daily practice

Chronic Care Model (CCM) →

Evidence-based care

Patient-centered

Integrates the clinical approach

This model has been:

- **Tailored to individual** children & teenagers and their families by HEALTH LITERACY
- **At the first visit**, patients and their parents follow a TE by a HC assistant on: prevention measures, early recognition of symptoms and intervention by personalised action plan, appropriate use of drugs and devices, maintainance of healthy lifestyle and of a diary of symptoms.
- **At the follow-up visits : adherence is assessed and reinforcement provided as needed**

WHO Therapeutic Education 1998

Guarnaccia S et al Pneumol Ped 2017

Guarnaccia et al. Italian Journal of Pediatrics (2017) 43:58
DOI 10.1186/s13052-017-0374-8

Italian Journal of Pediatrics

RESEARCH Open Access

IOEASMA: an integrated clinical and educational pathway for managing asthma in children and adolescents

Sebastiano Guarnaccia[1*], Gaia Pecorelli[1], Marina Bianchi[2], Massimo Cartabia[2], Gianluigi Casadei[3], Ada Pluda[1], Cristina Quecchia[1], Valeria Gretter[1] and Maurizio Bonati[2]

Results:
262 children with bronchial asthma completed the pathway and were included in the analysis.

Children who obtained **disease control increased from 44% at visit 1 to 79%, at visit 3 and at 1-year follow-up was 83%.**
Hospital admissions in 11% of children: 8% before the intervention, 2% during the intervention, and 1% before and during the intervention.

no hospitalizations related to bronchial asthma exacerbations were reported during the 2 follow-up visits.

These findings also demonstrated a strong economic advantage.

Guarnaccia et al. Italian Journal of Pediatrics (2017) 43:58
DOI 10.1186/s13052-017-0374-8

Italian Journal of Pediatrics

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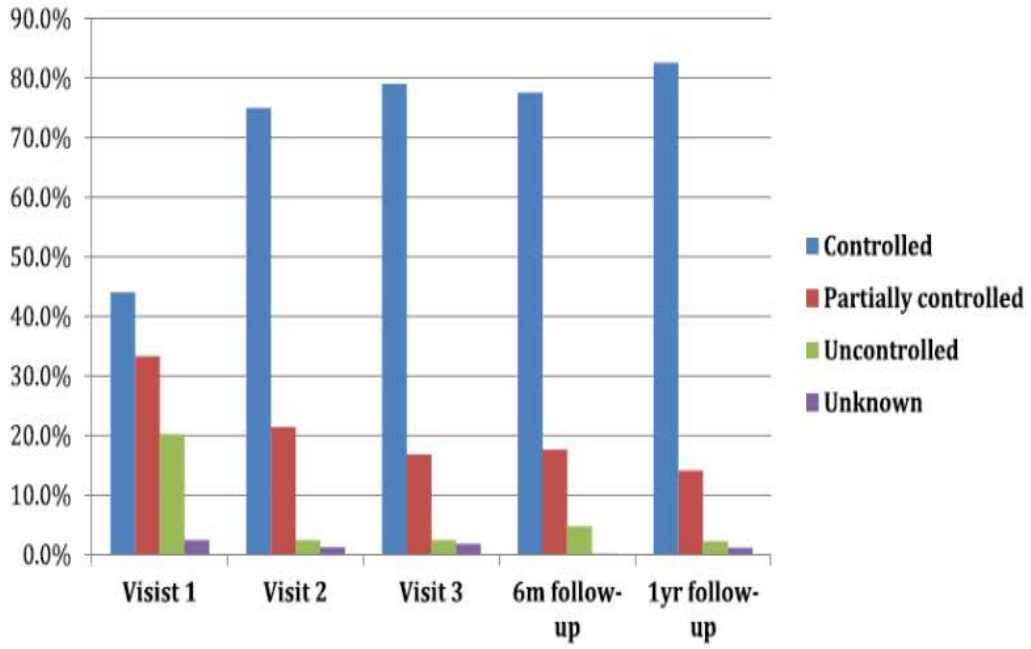

Fig. 2 Asthma control during the intervention period and at 6 months and 1 year follow-up

Accepted: 17 November 2017
DOI: 10.1111/pai.12839

ORIGINAL ARTICLE

WILEY

Evaluation of a diagnostic therapeutic educational pathway for asthma management in youth

Sebastiano Guarnaccia[1] | Cristina Quecchia[1] | Andrea Festa[2] | Michele Magoni[3] | Marco Moneda[4] | Valeria Gretter[1] | Carmelo Scarcella[3] | Ada Pluda[1] | Cinzia Gasparotti[3] | Malica Frassine[1] | Luigi Vitale[1] | Emanuele D'Agata[1] | Rosa Maria Limina[5] | Francesco Donato[2]

Retrospective cohort study : **806 patients aged 6-11 and 12- 17 years -DTEP in 2007-2014.**

- 572 patients (70.8%) completed the therapeutic educational pathways, attending 3 or more specialist's evaluations. (71.2% and 69% among subjects aged 6-11 and 12- 17 years, respectively
- **The mean of follow-up time was 5.0 and 4.5 years for 6-11 and 12-17 years old respectively.**
- A statistically significant decrease in all incidence rates from before to after DTEP was observed in both age groups,
- The rates **of drug prescription showed a statistically significant decrease** from before to after DTEP, for each class of medicine for asthma in both age groups, from percent difference of −66% in 12- to 17-year-old patients to −24.3% in children aged 6-11 years for inhaled corticosteroids

In total, per patient, **costs of drug prescriptions for asthma per year** from before to after DTEP, **decreased** in children

Age 6-11yrs from 160.24 euro to 91.59 euro
Age 12- 17 yrs from 200.33 euro to 90.55 euro

Guarnaccia S et al PAI 2017

Impact of a Diagnostic Therapeutic Educational Pathway Self-Management Program for Asthma Management in Preschool Children
Italian J Ped, Accepted

- **RESULTS:**

1103 patients aged **0-5 years** attended the Center "Io e l'Asma" from 1st September 2007 to 31st December 2014

741 patients, aged 0-5 years completed the DTEP, including 391 and 350 children **aged 0-2** and **3-5 years**, respectively.

- **Mean of follow-up time 4.7 and 5.5 years for each subject respectively 0-2 and 3-5 years old**

- The percentage of children **aged 0-2 and 3-5 years** showing **improved control of wheezing symptoms** during the 1st to 3rd visit interval as a result of the **DTEP intervention increased** from **39.5% to 60.9%** and from **25.5% to 75.5%,** respectively.

- A significant decrease for all outcomes, **from-8.6% to -80.4%.**

- specific IRs for **drug prescriptions declined**, particularly for LABA plus corticosteroids, antibiotics, and systemic corticosteroids

frontiers in Pediatrics

ORIGINAL RESEARCH
published: 11 March 2020
doi: 10.3389/fped.2020.00039

Evaluation of a Diagnostic Therapeutic Educational Pathway for Asthma Management in Children and Adolescents

This is a retrospective population-based cohort study, including two groups of patients with asthma, aged 6–17 years (a) the children who followed a DTEP (intervention group) and (b) all the children did not follow DTEP (control group).

9,191 patients included in the study, 804 of whom followed DTEP.

The mean follow-up time for children attending the Io e l'Asma center was 1.50 years before DTEP and 3.53 years after DTEP. Similarly, for the control children, the mean follow-up was 1.50 and 3.68 years in the early and late time since asthma diagnosis, respectively.

OUTCOMES

a) hospitalization: with primary discharge diagnosis of dyspnea, wheezing, or respiratory symptoms
b) use of outpatient services: spirometry, skin prick test, total and specific immunoglobulin E (IgE)
c) emergency room visits: with primary discharge diagnosis of dyspnea, wheezing, or respiratory symptoms
d) drug prescriptions: including the prescription of medicines for asthma by the children's primary care pediatrician

RESULTS

In the before-DTEP/early time, the intervention and control groups showed similar IRs for all the outcomes apart from emergency room visits (IRs of 138.6 and 60.3 per 1,000 person-years, respectively).
The IRs decreased from before to after DTEP and from early to late time in both groups. The IR decrease for emergency room visits was significantly higher in the intervention than in the control group (−51.3 and −28.2%, respectively; IRR = 0.61, $P = 0.001$).

Outline

Background

Developing the « IoeAsma» Project

Going beyond asthma management: approaching health promotion with lifestyles

Conclusions

From Chronic Care Model - CCM
TO
Expanded Chronic Care Model - ECCM
WITH
Clinical Health Promotion path

CCM → **ECCM**

Patients receive **three clinical visits** (0 weeks, 8-12 weeks, 16 -20 weeks) and a follow-up visits at six months and one year.

Lifestyles:

1) smoking
2) nutrition
3) physical activity
4) psychosocial

A clinical and health promotion database was developed to track **health indicators** (i.e. smoking exposure, bullying, physical activity, nutrition).

Clinical and health promotion asthma management: an intervention for children and adolescents

Sebastiano Guarnaccia, M.D.,[1] Charvonne N. Holliday, Ph.D., M.P.H.,[2] Emanuele D'Agata, RN,[1] Ada Pluda, RN,[1] Gaia Pecorelli, MSc,[1] Valeria Gretter, M.D.,[1] Susanna Facchetti, M.D.,[1] Richard A. Bilonick, Ph.D.,[3] Matthew G. Masiello, M.D., M.P.H.,[4] and Edmund Ricci, Ph.D., M.Litt.[5]

- Patients (n = 304) were recruited and participated in a motivational interview, received clinical care, and were monitored longitudinally.
- Eligible patients (n = 53) were referred to one or more intervention pathways regarding physical activity, nutrition, smoking cessation, and psychosocial wellness.
- A comparison group (n = 90) was eligible for an intervention but chose not to participate.

Results

- Among patients who were invited to participate in the health promotion pathways, significant decreases in asthma exacerbation were achieved by the patients who participated in the intervention compared with those who did not participate ($p = 0.018$).
- Significant improvements in asthma exacerbation, activity limitations, and asthma control were attributed to the time in clinical care ($p < 0.001$).
- In this group, asthma control significantly improved with medication ($p = 0.002$), and age was associated with a significant decrease in asthma exacerbation ($p = 0.011$).

Guarnaccia S et al Allergy Asthma Proc 37: e70–e76, 2016

CONCLUSIONS - 1

Clinical and health promotion asthma management: an intervention for children and adolescents

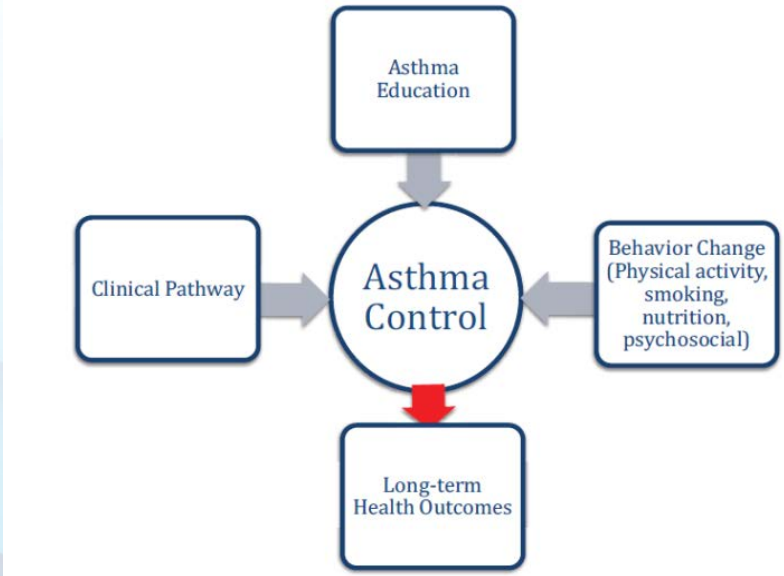

Figure 1. Conceptual framework outlining the theoretical influence of clinical-based health promotion on pediatric patients with asthma.

Guarnaccia S et al Allergy Asthma Proc 37: e70–e76, 2016

THANK - YOU

Team
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Edmund Ricci
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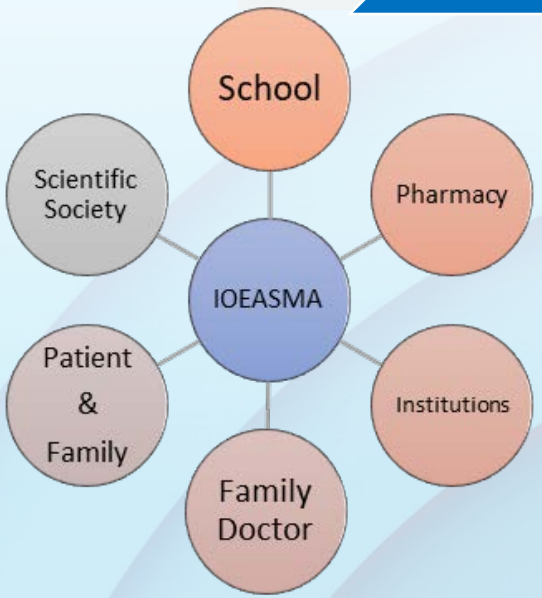
CONCLUSIONS - 2

Diagnostic Therapeutic Educational Pathway (DTEP)

Guideline → THERAPEUTIC EDUCATION → CCM/ECCM → Leaflet → ioeasma.it → TELEMEDICINE

Clinical Health Promotion Pathways

- Nutrition
- Physical Activity
- Phychosocial
- Smoking



2019 – TRANSITION/EXPANSION TO ADULT

2020 – DTEP and TELEMEDICINE

DTEP IMPLEMENTATION WITH TELEMEDICINE DURING COVID-19: 1700 PATIENTS EVALUATED

Collaborations and Partnership to implement the IOEASMA model

A working group with MMG and PLS, Brescia, Lombardy, Italy; 2003 -
Windber Research Institute /CHPDP U.S.A. & Department of Behavioral and Community Health Sciences, University of Pittsburgh, PA, U.S.A., 2008 – 2016
Mount Sinai, School of Medicine, Department of Chronicity, New York, U.S.A.; 2009
Istituto Farmacologico (IRCS) Mario Negri, Milano 2010 –
Therapeutic Education for Chronic Disease,
Medical School, University of Ginevra, Switzerland, 2010–2011
University Cattolica of Sacro Cuore, Brescia, 2010 – 2018
Department of Epidemiolgy and Public Health, University of Brescia, 2014 –
Local Health Authority (ATS), Brescia, Primary Care Department, 2015 –
University of Brescia, 2013–2017
University of Lugano, Switzerland, Communication department 2017 –
University of Brescia, Department of Clinical and Experimental Science 2018 –
ASST, Spedali Civili of Brescia, University/Hospital 2018 –
AUSSL 5 Rovigo, Veneto, Italy, Allergy/Pulmonology Clinic 2019 –

Aknowledgements

- The non-profit Foundation "Associazione Laboratorio Clinico Pedagogico e Ricerca Biomedica" Now "Ambra Onlus", Brescia, Italy
- "Io e l'Asma", now "APP", non-profit association, Pachino, Italy
  for the **support, patience and passion** throughout the years.
- The contribution of family physicians of the local health authority to share the project designing and applying the diagnostic - therapeutic-educational pathway in the daily clinic.

IOEASMA model: A LONG JOURNEY …..

1. **1993**
   MULTI-DISCIPLINARY WORKING GROUP
2. **1993 - 1997**
   BUILDING THE TOOLS & DISSEMINATION
3. **1993-1997**
   Booklet
   Training Course
   For family and school
   & Dissemination
4. **1999 - 2004**
   Local Guidelines
   CD for health professionals &
   Dissemination
5. **2000 - 2002**
   Face-to face meetings
   Website
6. **2007 - 2011**
   Diagnostic Therapeutic Pathway &
   Therapeutic Education
   Chronic Care Model
7. **2011 - 2014**
   Health Promotion with Expanded Chronic Care Model
8. **2019 – ONGOING**
   - **EXPANSION TO ADULT**
   - **INSTRUCTING THE INSTRUCTORS**
9. **2020 – ONGOING**
   DTEP with TELEMEDICINE

THANK YOU !!

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