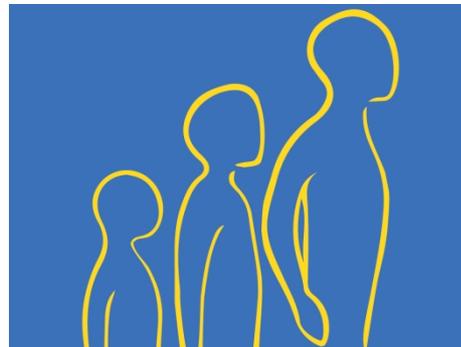


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Article type : Guidelines

EAACI Guideline on the effective transition of adolescents and young adults with allergy and asthma

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**ADOLESCENT
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This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1111/ALL.14459

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Key words: adolescent, asthma, food allergy, rhinoconjunctivitis, transition, teenager, young adult, allergy.

Short title: EAACI Recommendations on Adolescents and Young Adults

Word count: 4500

ABSTRACT

Adolescent and young adult (AYA) patients need additional support while they experience the challenges associated with their age. They need specific training to learn the knowledge and skills required to confidently self-manage their allergies and/or asthma. Transitional care is a complex process which should address the psychological, medical, educational and vocational needs of AYA in the developmentally appropriate way. The European Academy of Allergy and Clinical Immunology has developed a clinical practice guideline to provide evidence-based recommendations for healthcare professionals to support the transitional care of AYA with allergy and/or asthma. This guideline was developed by a multidisciplinary working panel of experts and patient representatives based on two recent systematic reviews. It sets out a series of general recommendations on operating a clinical service for AYA, which include: (i) starting transition early (11-13 years), (ii) using a structured, multidisciplinary approach, (iii) ensuring AYA fully understand their condition and have resources they can access, (iv) active monitoring of adherence and (v) discussing any implications for further education and work. Specific allergy and asthma transition recommendations include (i) simplifying medication regimes and using reminders; (ii) focusing on areas where AYA are not confident and involving peers in training AYA patients; (iii) identifying and managing psychological and socioeconomic issues impacting disease control and quality of life; (iv) enrolling the family in assisting AYA to undertake self-management and (v) encouraging AYA to let their friends know about their allergies and asthma. These recommendations may need to be adapted to fit into national healthcare systems.

Abbreviations

AGREE II - Appraisal of Guidelines for Research & Evaluation

AYA- Adolescent(s) and young adult(s)

CBT- Cognitive behavioural therapy

EAACI – European Academy of Allergy and Clinical Immunology

HCP- Healthcare professional(s)

HEADSS -Home, Education/ Employment, peer group, Activities, Drugs, Sexuality, Suicide/ depression)
assessment

HRQL – health related quality of life

MI- Motivational interviewing

QOL- Quality of life

TF – Task Force

INTRODUCTION

Adolescents and young adults (AYA) represent a large group of patients with allergy and/or asthma. Their medical care is complicated by the biological and psychosocial changes that occur during adolescence. As AYA gain increasing autonomy, they also have to become more socially and financially independent, whilst their primary relationships switch from family to peer-based interactions. It is now acknowledged that these changes encompass a much longer period than previously thought¹, continuing until around 25 years of age. For these reasons, this guideline focuses on the 11-25 year age group.

The challenges faced by adolescence and early adulthood impact both on the symptoms they experience and how these are managed; they also impact on how the symptoms and management are perceived and accepted. AYA may not fully understand the consequences of diseases. They may fail to take responsibility for self-management, leading to suboptimal adherence to treatment and other negative effects. This period of life is particularly challenging because it occurs when AYA undergo numerous life events linked with changes in education, work, travel and the establishment of more mature relationships. In addition, many AYA are transferred from paediatric to adult medical services, at the same time as they may experience a sense of loss and fear of the unknown which may lead to failure to follow up and more frequent hospitalizations.

Developmentally appropriate healthcare (DAH) recognizes the biopsychosocial developmental changes of AYA and the need to empower young people by embedding health education and health promotion in consultations. It is critical for AYA to acquire the knowledge, skills and confidence required to become independent, competent and expert adult patients. This process is known as transition (Box 1) and entails much more than the simple transfer of a patient from paediatric to adult care. The process of transition is also important when an allergy clinic caters for all age groups. If effectively learnt and utilized, constructive self-management skills will serve to support patients throughout their adult lives enabling them to achieve better health outcomes. We know from a recent European survey that healthcare professionals (HCP) find AYA

to be a challenging group to manage.² To understand how to approach this age group, it is necessary to understand what is happening during adolescence.

What is happening during adolescence?

Changes in the brain underpin many changes during adolescence as both complex abstract thought and maturity in decision-making develop. Research in developmental psychology and neuroscience reveals that during adolescence there is an imbalance between systems supporting reactivity and regulation. Prefrontal areas are still developing until late adolescence (>18–21 years), while hypersensitive reward systems have already evolved, creating a disparity between emotions and control. Behavioural economics has shown that risk-taking is not a simple process, and is not only affected by attitudes toward known risks but also by attitudes toward unknown or ambiguous situations, in which the likelihood of positive and negative outcomes are not known.⁶ It is not that adolescents choose to engage in risks, but, rather, they are willing to gamble when they lack complete knowledge. When adolescents meaningfully understand a risky situation, they are even more risk-averse than adults.⁶ In addition, adolescent decision-making typically occurs in busy environments that often involve complex motivations. Prominent motivations at this age, which can compete and conflict with one another, include maintaining status with peers, achieving goals in academic, athletic, or other areas, finding independence and maintaining harmony within the family.

The guideline on the effective transition of adolescents and young adults

This guideline has been prepared by the European Academy of Allergy and Clinical Immunology's Task Force (TF) on Adolescents and Young Adults. It aims to assist HCP in transitioning 11-25 year age patients with asthma and other allergic conditions. In addition, the TF aims to identify gaps in knowledge and implementation, unmet needs and potential future perspectives. The primary audience for this guideline is clinical allergists (specialists and subspecialists), paediatricians, primary care workers, physicians from other related disciplines, nurses, dieticians, social workers and psychologists working across a range of primary, secondary, and tertiary care settings. Healthcare managers, research funding bodies and health policy makers may also find this

guideline useful. The development of the guideline has been informed by two formal systematic reviews^{7,8} with systematic review principles being used to identify additional evidence, where necessary. The guideline does not intend to provide advice about the management of individual allergic conditions in AYA. A separate manuscript will provide practical advice on how to

Box 1. Key terms

Adherence: the extent to which patients take medication as prescribed by their doctor.

Adolescents and young adults: patients with allergy and/or asthma aged 11-25 years.

Adolescents and young adult-centred care: medical care that focuses on the needs of the adolescent and young adult, the specific format will depend on the developmental level of the patient.

Allergic conditions: asthma, urticaria, drug and venom allergy, anaphylaxis, eczema, food allergy and allergic rhino-conjunctivitis, allergic gastrointestinal disease.

Cognitive behavioural therapy: psychological approach to changing people's beliefs and behaviours by focusing on the interaction between thoughts, images, beliefs, emotions, physical symptoms and behaviours.

Developmentally-appropriate healthcare: format takes into account the developmental level of the patient

Health literacy: ability to obtain, read, understand and use healthcare information and make appropriate healthcare decisions including following treatment plans.

Health-related quality of life: quantification of the impact of illness on physical, mental, emotional and social life of a patient.

Motivational interviewing: psychological approach that aims to help an individual develop motivation to make positive decisions and achieve specific goals.

Multi-systemic approach: psychological, family-based intervention adapted for the treatment of poor illness management.

Patient activation measures: assessment of patient's knowledge, skill and confidence for managing their health and healthcare.

Peer-led interventions: the teaching or sharing of health information, values and behaviours between individuals peers.

Transition: 'an active and evolving process that addresses the medical, psychosocial, and educational needs of young people as they prepare to move from child- to adult-centred health care'.¹⁷

Transfer: moving from paediatric to an adult healthcare system.

Transition readiness assessment tool: questionnaire completed by the patient or healthcare professional to assess the AYA competency with self-management of their allergy and asthma (e.g. 'ready, steady, go' or hospital's own document).

Transition report: detailed written medical report to adult specialist summarizing the paediatric care

implement these transition recommendations into everyday clinical practice and give examples about how to organize a transition clinic and optimise service delivery.

METHODOLOGY

This guideline was generated using the principles of the Guidelines International Network using the Appraisal of Guidelines for Research & Evaluation (AGREE II) approach^{9,10} (see online supplement – appendix 1). The process started in January 2018 with a web-based discussion about the process and the key clinical areas to address, followed by face-to-face meetings and regular web conferences in which HCP and lay representatives participated.

Ensuring appropriate stakeholder involvement

Members of the EAACI TF on Adolescents and Young Adults from 10 European countries represented a range of disciplinary and clinical backgrounds, including allergists (specialists and subspecialists), paediatricians, psychologists, primary care, dermatologists, otolaryngologists, nurses and patient organization representatives. Additionally, a survey of stakeholders was undertaken in June 2019 to understand how adolescents and young adults are currently managed and the challenges faced by their HCP.²

Systematic reviews of the evidence

Three key questions were addressed: (i) What are the challenges and specific needs of adolescents and young adults with allergic conditions, including asthma, food allergy and anaphylaxis, allergic rhino-conjunctivitis, atopic dermatitis, chronic urticaria, allergic gastrointestinal disease, as well as those with complex multisystem allergic disease? (ii) What specific strategies have proven useful to improve self-management and wellbeing in this population? (iii) What generic approaches are helpful when managing adolescents and young adults? The first two were pursued through two formal systematic reviews (SRs) of the evidence with a cut-off date of February 10, 2019.^{7,8} The final question was assessed by a SR of the evidence-based adolescent and young adult guidelines from the last 5 years with a cut-off date of June 21, 2019. Individual studies from these guidelines were accessed to determine level of evidence and grade of recommendation. The TF members continued to track evidence published after our systematic review cut-off date and, where relevant, studies were considered by the TF chairs.

Box 2. Assigning levels of evidence and strength of recommendations

Level of evidence

Level I	Systematic reviews, meta-analysis, randomized controlled trials
Level II	Two groups, non-randomized studies (e.g., cohort, case-control)
Level III	One group, non-randomized (e.g., before and after, pre-test, and post-test)
Level IV	Descriptive studies that include analysis of outcomes (single-subject design, case series)
Level V	Case reports and expert opinion that include narrative literature, reviews, and consensus statements

Grades of recommendation

Grade A	Consistent level I studies
Grade B	Consistent level II or III studies or extrapolations from level I studies
Grade C	Level IV studies or extrapolations from level II or III studies
Grade D	Level V evidence or troublingly inconsistent or inconclusive studies at any level

Strength of recommendations

Strong	Evidence from studies at low risk of bias
Moderate	Evidence from studies at moderate risk of bias
Weak	Evidence from studies at high risk of bias

Recommendations are phrased according to the grade of recommendation:

- Grade A: “is recommended”
- Grade B: “can be recommended”
- Grade C: “may be recommended”
- Grade D: “may be considered”

Approach adapted from Oxford Centre for Evidence-based Medicine - Levels of Evidence and Grades of Recommendations.¹¹ The adaptation involved providing an assessment of the risk of bias, based on the Cochrane risk of bias tool, of the underpinning evidence and highlighting other potentially relevant contextual information plus basing recommendation phrases on the grade.

Formulating recommendations

The TF members graded the strength and consistency of the key findings from the SRs.^{7,8} These were used to formulate evidence-based recommendations for clinical care based on the relative

Accepted Article
balance between potential benefits, side effects and risks.¹¹ (Box 2). This involved formulating clear recommendations with the strength of evidence underpinning each recommendation while phrasing was according to the grade of recommendation (Box 2). For many recommendations in the generic section, there was only level V evidence available (Grade D), therefore, 'may be considered' is used. To ensure that these recommendations were robust, a modified Delphi approach was used to achieve consensus within the TF (see online supplement).

The TF aimed to minimize bias at every step. TF members identified the resource implications of implementing the recommendations, barriers, facilitators, potential approaches to the implementation of each recommendation and suggested audit criteria to help with assessing organizational compliance.

Peer review and public comment

The draft guideline was externally peer-reviewed by invited experts from a range of professional backgrounds. The draft was also made available on public domain on the EAACI web site for a 3-week period in February to March 2020 to allow a broader array of stakeholders to comment. All feedback was considered by the TF members and, where appropriate, revisions were made. Further feedback should be addressed to the corresponding author. Additionally, AYA and their parents/carers were invited to consider the importance that they attached to each draft recommendation during the development of the guideline (for further details see online supplement). All recommendations achieved a median of important or very important in both groups.

Identification of evidence gaps

The process of developing this guideline has identified a number of evidence gaps which were prioritized (Table 8).

Editorial independence and managing conflict of interests

This guideline was funded and supported by EAACI. The funder did not have any influence on the guideline production process, on its contents or on the decision to publish. TF members' conflicts

of interest were declared and taken into account by the TF chairs as recommendations were formulated.

Updating the Guideline

EAACI plans to update this guideline in 2025 unless there are important advances before then.

GENERAL TRANSITION (Table 1)

Eight guidelines focusing on the transition of AYA with juvenile-onset rheumatic arthritis^{12,13}, coeliac disease¹⁴, gastroenterological conditions^{15,16}, liver diseases¹⁷, young people using health or social care services¹⁸ and AYA with special health care needs¹⁹ were identified from the last five years. Most of the evidence stemmed from expert opinion derived from clinical experience or qualitative studies reviewed systematically; very few randomized controlled trials were referenced.

Starting transition

Preparation for transition may be considered from early adolescence (11-13 years) in accordance with the patient's developmental stage (Grade D).¹³⁻¹⁹ This will allow AYA to gradually acquire new knowledge about their disease and develop self-management skills, allowing them to take increasing responsibility for their medical care. It is generally agreed that the optimal timing for initiation of the transition process cannot be based on chronological age. An individualised, flexible approach is required. The following factors might be considered by HCPs to determine the ideal age to start the transition process: mental and physical development, disease activity, health literacy, adherence to treatment, autonomy in disease management, family's socioeconomic circumstances and school format (due to increased patient responsibility as move up the schooling system).

Transition readiness questionnaires are tools which consist of a list of desirable skills and educational targets that AYA should ideally meet before transfer to adult care.^{13,15,17,19} There is a lack of validated readiness assessment tools for AYA with allergy and/or asthma but several generic tools are available such as Transition Readiness Assessment Questionnaire²⁰, "Ready, Steady, Go"²¹ and TR(x)ANSITION Scale²². HCP may consider using one throughout the transition process to track progress and identify areas where AYA need more help to build knowledge and understanding, autonomy and self-management skills (Grade D).

Involving the AYA, family and other HCP

Collaboration and engagement of all stakeholders are essential for a successful and smooth transition process. Transition can be complex and more difficult in patients with multiple allergic diseases. It is important that the family are involved in supporting AYA self-management, thereby encouraging independence. During the transition process, HCPs may consider helping AYA (with their parents/caregivers) to understand their allergy and asthma, possible complications, treatment rationale (including medication name, dosing, possible side effects), effective management strategies and how to recognize higher risk symptoms (Grade D).^{12,15,16,18,19} Important skills for AYA to learn are how to make appointments, identify when and whom to contact in case of relapse, how to negotiate and understand the transition process and how to access the support available. AYA should ideally be offered portable, accessible information in the form of leaflets, web-pages, or audio for AYA to foster inclusivity and address diverse needs. It may be also helpful for AYA to have their own personal transition plan, developed together with a HCP and written in a form of a 'roadmap' towards agreed short and long term goals and desired outcomes for transition. As adolescents are generally characterized by low levels of adherence, HCP may consider monitoring this more closely during the transition process (Grade D).^{12,14-17} It has been shown that AYA are more likely to follow treatment plans and attend adult service medical appointments when they have a good knowledge of their disease and the reasons for treatment^{23,24} and good family support.²⁵

Wider aspects to consider

Another important aspect that HCP may consider covering during the transition process is developing skills related to self-management of allergy and/or asthma, within current and potential future education or work (Grade D).^{12,15,18,19} Other areas for discussion may be life skills, future health concerns, educational and employment goals, independent living and housing options, financial needs, psychosocial aspects, mental health, drugs and alcohol, healthy sexuality and reproduction. HEADSS (Home, Education/ Employment, peer group, Activities, Drugs, Sexuality, Suicide/ depression) assessment is a helpful framework for such discussions.²⁶ Apart from medical appointments, other options for communication between HCP and AYA such as phone calls, web-based or mobile technologies, can be recommended to improve the effectiveness of the transition process (Grade B).^{15,17,18}

Integrated regional approach involving paediatric and adult services

For optimal outcomes, a structured, multidisciplinary transition programme with a shared regional or network protocol developed by HCP, AYA, and parents/carers may be considered (Grade D).^{12,13,15,17-19} This could include age-appropriate written information. Several guidelines have suggested that regular meetings may be considered between paediatric and adult HCP improve the effectiveness of the transition programme (Grade D).^{16,17} If transfer to another clinical service is required, it would be helpful for the AYA to have had a recent comprehensive review of allergic conditions to optimize their management plan and generate an up to date transition report. This would cover the AYA's medical history, treatments, emergency care plan, follow-up, comorbidities and any other relevant information. Furthermore, an integrated transition programme would be helpful with input from paediatric and adult providers and primary care, ideally as part of the well-coordinated multidisciplinary team. This may be considered to include a period of overlap between these services to help build relationships and establish effective adult care and management (Grade D).¹²⁻¹⁹ Feedback from the adult to the paediatric clinic and primary care about AYA's attendance, circumstances and any changes in management is essential for continuity of the medical care and flow of information between all HCPs involved in the individual's care.

Training and audit

To achieve a good transition pathway, HCPs may need training to help them understand the developmental aspects of AYAs, the transition process, and how to engage AYA in behavioural change (Grade C).^{12,13,19} It may be useful to have a lead HCP to coordinate the transition process and training as well as being the contact person for AYA and parents/carers. Lastly, regular audit of a transition service may be recommended to assess key performance indicators and improve service provision (Grade C).^{15,18,19} Audits should involve AYAs and families, policy and decision makers, administrators, researchers, HCPs and government agencies.

Table 1. Generic recommendations for adolescents and young adults with allergy and/or asthma

Generic recommendations (Grade, Evidence level)	Other considerations	References*
Preparation for transition may be considered from early adolescence (11-13 years) in accordance with the patient's developmental stage (D, IV-V)	HCP may want to consider the following when deciding when to start the transition process: mental and physical development, disease activity, health literacy, adherence to treatment, autonomy in disease management, family's socioeconomic circumstances and school format.	Foster ¹³ ; Elli ¹⁶ ; CAPHC ¹⁹ ; Vajro ¹⁷ ; NICE ¹⁸ ; Brooks ¹⁵ ; Ludvigsson 2016 ¹⁴
For a transition model to be effective, the following may be considered for inclusion:		
- the use of a structured, multidisciplinary transition programme within the clinic/healthcare unit (D, I-V)	Shared regional protocol agreed with HCP, AYA, parents/careers, HCP and regularly updated at least every 5 years. This could include age-appropriate written information and structured transition communication/reports between all paediatric and adult HCP. It may be helpful to have a lead person to coordinate the transition process and be a contact person for HCP, AYA and parents/carers.	Calvo, 2015 ¹² ; Foster, 2016 ¹³ ; Brooks ¹⁵ ; CAPHC ¹⁹ ; NICE ¹⁸ , Vajro ¹⁷
- informing AYA and parents/caregivers about allergy and/or asthma as well as the transition processes and the support available in a form that is appropriate for	HCP may want to consider including the following information: purpose of transfer to an adult setting and what to expect when they come there; location of available adult centres, disease characteristics, treatments (including side effects), how to recognize alarm symptom, how to assist AYAs to take on their own care and support available. Ideas for formats: leaflets, web-page, audio for AYA with disabilities. It may be helpful for AYA to have their own personal	Brooks ¹⁵ ; Calvo ¹² ; Elli ¹⁶ ; CAPHC ¹⁹ ; NICE ¹⁸

their developmental stage (D, I-V)	transition plan ^{17,19} .	
- a checklist of skills and knowledge to assess AYA readiness for transition (D, I-V)	Tools can be used several times throughout the transition process in order to identify which areas of AYA self-management and well-being need to be addressed and improved. There are no specific allergy and asthma tools but generic ones are available: Transition Readiness Assessment Questionnaire ²⁰ , "Ready, Steady, Go" ²¹ and TR(x)ANSITION Scale ²² .	CAPHC ¹⁹ ; Vajro ¹⁷ ; Brooks ¹⁵ ; Foster ¹³
- active monitoring of adherence to treatment through the transition process (D, I-V)	Adherence may benefit from targeted specific educational and organisational interventions, e.g. more frequent appointments ¹⁵ , repeated education. A good open dialogue and communication is important. AYA with "new onset" of a disease will have minimal prior experience and so need more input.	Calvo ¹² ; Brooks ¹⁵ ; Vajro ¹⁷ ; Ludvigsson ¹⁴ ; Elli ¹⁶
-a period of overlap between paediatric and adult care providers before AYA is transferred, then feedback from the adult to the paediatric clinic about their attendance and any changes in management (D, I-V)	Where AYA care needs to be moved to another service clinic, AYA medical information (ideally in the form of a transition report) should be transferred to the adult medical service. Where possible, AYA should be seen in a joint paediatric-adult clinic, AYA should ideally see the same HCP in adults' services for at least the first 2 attended appointments after transfer ¹⁸ .	Calvo ¹² ; Foster, 2016 ¹³ ; Elli ¹⁶ ; CAPHC ¹⁹ ; NICE ¹⁸ ; Ludvigsson ¹⁴ ; Brooks ¹⁵ ; Vajro ¹⁷
- regular meetings between paediatric and adult care providers (D, I-V)	Particular focus should be placed on more complex patients. Meetings could be virtual. Process could be informed by areas of the assessment tools e.g. adherence, disease activity outcomes,	Elli ¹⁶ ; Vajro ¹⁷

	HEADSS ²⁶ .	
Other options for effective communication between HCP and AYA can be recommended (eg web-based, mobile technologies) (B, I-V)	Options may include web-based communication boards and digital communication tools such as text.	Vajro ¹⁷ ;Brooks ¹⁵ ; NICE ¹⁸
Discussion of self-management of AYA allergy and/or asthma within current and potential future college, university, work or social environments may be considered (D, I-V)	Areas that HCP may want to consider discussing lifestyle, future health concerns, educational and employment goals, independent living and housing options, financial needs, psychosocial, mental health, sexuality and reproduction. Particular attention is required while taking exams, especially in AYA with allergic rhinitis. Additional help may be needed from other professionals, eg psychologist, social and youth worker.	Calvo ¹² ; CAPHC ¹⁹ ; NICE ¹⁸ ; Brooks ¹⁵
Specific training in transitional and AYA care may be recommended for all HCP involved in transition process (C, II-V)	Training in generic transition process, disease-specific and developmentally-appropriate care (e.g. clinical experience, e-learning, workshops) as part of the continuing professional development. Developmentally-appropriate healthcare should be practiced.	Calvo ¹² ; Foster ¹³ ; CAPHC ¹⁹
Regular audit of a transition service may be recommended to assess key performance indicators and improve service provision (C, I-V)	Audit should involve AYA and families, policy and decision makers, administrators, researchers, HCP and government agencies.	Brooks ¹⁵ ; CAPHC ¹⁹ ; NICE ¹⁸

*Recommendations: Foster 2017¹³, juvenile-onset rheumatic diseases; Ludvigsson 2016¹⁴, coeliac disease, Brooks 2017¹⁵, chronic digestive diseases; Vajro 2018¹⁷, liver; NICE 2015¹⁸, young people using health or social care services; Calvo 2015¹²; rheumatic patients with childhood onset; Elli 2015¹⁶, gastroenterological patients; CAPHC 2016¹⁹, AYA with special health care needs.

AYA, adolescents and young adults; HCP, healthcare professionals; NICE, National Institute for Health and Care Excellence; CAPHC, Canadian Association of Paediatric Health Centres, HEADSS (Home, Education/ Employment, peer group, Activities, Drugs, Sexuality, Suicide/ depression) assessment.

TRANSITION SPECIFIC TO ALLERGIC CONDITIONS AND/OR ASTHMA

Recommendations specific to allergic conditions and/or asthma were developed by the TF based on the two underpinning systematic reviews.^{7,8}

Improving adherence (Tables 2, 4 and 5)

There are numerous data documenting poor adherence to treatment during adolescence. This is therefore an important issue to consider. HCP should make time to explore barriers which may be related to the patient, particularly their understanding and preconceptions, competing activities, their support or medication regime. Simplifying medication regimes, such as the use of a single inhaler combining inhaled corticosteroid and long-acting β 2 agonists, may be recommended to improve adherence (Grade C)(Table 2).²⁷ Several studies indicate that low self-efficacy (confidence in performing a specific activity) is related to poor medication adherence, both in AYA with asthma and/or food allergy.^{28,29,30-33} One controlled study showed that text reminders to take medication could improve treatment adherence in AYA with asthma³⁴; however, the number of participants was small and this finding needs to be confirmed by larger studies. Other types of reminders, such as prompts to take medication, mobile applications and web-based applications, monitors or routines can be recommended to improve adherence, symptom control and quality of life (Grade B)(Table 2).³⁵⁻³⁸ One study with a large sample showed a positive effect of cognitive behavioural therapy (CBT) using a multi-systemic approach on asthma treatment adherence, as well as on asthma knowledge, self-management and symptom control in adolescents. Cognitive behavioural therapy can be recommended to improve adherence (Grade B)(Table 4).³⁹⁻⁴² Also, data suggest that amending family routines to give AYA time to fit in management behaviours may be recommended to improve adherence with medication in AYA (Grade C)(Table 5).^{43,44} Finally, avoidance strategies such as dietary restrictions and label reading are also very important but there is little literature to guide the best approach to improving patient adherence to these strategies.

Table 2. Adherence recommendations for adolescents and young adults with allergy and/or asthma

Simplifying medication regimes may be recommended to improve adherence (Grade C, Evidence level IV)		
<i>Strength of recommendation:</i> Weak recommendation with evidence coming from a single study involving participants with asthma from 22 years of age. ²⁷	<i>Other considerations:</i> Evidence comes from the use of combined corticosteroid and long-acting bronchodilator inhalers for asthma but is likely to be generalizable. If possible use the same inhaler system for all inhaled medications for the same patient and if possible restrict to once daily.	<i>References:</i> Axelsson ²⁷ .
Medication reminders, mobile applications and web-based applications, monitors or routines can be recommended to improve adherence, symptom control and quality of life (Grade B, Evidence level I-IV)		
<i>Strength of recommendation:</i> Weak recommendation for smartphone-based health applications, medication reminders or monitors as only suggested by qualitative studies. ^{35,36,38} Recommendation for the use of a specific web-application (MyMediHealthApp) is moderate since efficacy proven by a controlled trial. ³⁴	<i>Other considerations:</i> A smartphone-based personalized health app, medication reminders or monitors were suggested in qualitative studies. All studies focused on asthma but likely to be also applicable to allergy.	<i>References:</i> Naimi ³⁵ , Blaakman ³⁶ , Koster ³⁸ , Johnson ³⁴ .

AYA, adolescents and young adults.

Optimising self-management (Table 3)

Empowering AYA with self-management skills can help them become autonomous, expert patients, minimising their dependency on parents and HCP. It is therefore essential that AYA have the knowledge and skills to ensure they can self-manage their allergies and/or asthma effectively and confidently. Focusing consultations on areas where AYA say they are not confident may be recommended to improve self-management including adherence (Grade C).²⁸⁻

³³ Barriers to successful self-management such as poor symptom perception and failure to take responsibility need to be addressed.⁷ Facilitators to self-management which could be employed are the use of routines, simple treatment regimes, better understanding, a positive attitude and support from family, friends and school/college.⁷

To facilitate self-management, a personal action plan may be recommended to assist AYA in self-managing their allergy and/or asthma (Grade C).^{29,31,45,46} Plans should be developed with the AYA and parents/carers which could be smartphone-based.⁴⁶

Peer-led interventions are recommended to improve asthma-related quality of life, asthma knowledge, and to reduce asthma-related doctor visits and school absence (Grade A).⁴⁷⁻⁵¹

Adolescents are likely to mirror the behaviour of their peers. To date, these peer-led interventions have been demonstrated in randomised controlled trials for AYA with asthma; they may also be useful for other allergic conditions.

AYA with allergy and/or asthma are frequently excluded from activities, which may have an impact on their developing social skills. Consideration may be given to supporting the AYA, family and the wider community to allow AYA to be included in social events (Grade D).⁵²⁻⁵⁵ This may involve encouraging them to focus on sports that are less likely to exacerbate asthma (e.g. swimming) or undertake sport at times when symptoms are less likely to be triggered (e.g. avoiding cold mornings or pollen peaks). Ensuring that the menu for school trips or parties does not contain relevant food allergens will be helpful for some AYA; it is therefore important that AYA develop the necessary self-advocacy communication skills to inform organisers about their allergy. Additionally, educating teachers, club staff, and other parents about allergy/or and

asthma is important as mistaken beliefs can present a barrier to effective communication and integration in social contexts.^{52,55}

Motivational interviewing (MI) can be recommended to improve understanding and perception of the disease and adherence, thereby reducing asthma symptoms and improving quality of life (Grade B).⁵⁶ MI has been widely used in medicine and other settings in this age group. The approach seeks to increase motivation to change behaviours and then encourages the AYA to set goals for themselves. Training is required for HCP to effectively utilise MI.

Table 3. Self-management recommendations for adolescents and young adults with allergy and/or asthma

Focusing consultation on areas where AYA say they are not confident may be recommended to improve self-management including adherence (Grade C, Evidence level IV)		
<i>Strength of recommendation:</i> Weak recommendation based on low risk of bias in cross-sectional ^{28,30} and qualitative studies ^{29,31-33} . These included AYA with both asthma ^{28,33} and food allergy ²⁹⁻³² .	<i>Other considerations:</i> Barriers to self-management associated with poor self-efficacy should be identified so that specific measures can be taken to overcome these. ⁷	<i>References:</i> Rhee ²⁸ , Saleh-Langenberg ³⁰ , Jones ³¹ , Jones ²⁹ , MacAdam ³² , Holley ³³
Formulation of a personal action plan with the AYA and their family to enable them to self-manage their allergy and asthma may be recommended (Grade C, Evidence level 1-IV)		
<i>Strength of recommendation:</i> Weak to moderate recommendation based on high risk of bias in one randomized controlled trial ⁴⁶ and on low risk bias in cross-sectional studies ^{29,31,45} . These included AYA with both asthma ⁴⁶ and food allergy ^{29,31,45} .	<i>Other considerations:</i> Smartphone based personalized action plan may lead to improvement in asthma control test ⁴⁶ . Other formats may be preferred by some AYA. A plan should be in used from before adolescence and be regularly reviewed by all patient's HCPs.	<i>References:</i> Perry ⁴⁶ , Jones ²⁹ , Jones ³¹ , Warren ⁴⁵
Peer-led interventions are recommended to improve asthma related quality of life, asthma knowledge, and to reduce asthma related doctor visits and school absence (Grade A, Evidence level I)		
<i>Strength of recommendation:</i> Strong recommendation based on low ^{47,51} and moderate risk of bias ⁴⁸⁻⁵⁰ interventional studies focusing on AYA with asthma. Three studies	<i>Other considerations:</i> Peers included in the studies were older AYA from similar backgrounds, either with or without asthma, trained to 'teach' allergic teens. This approach is	<i>References:</i> Al-Sheyab ⁴⁷ , Gibson ⁴⁸ , Rhee ⁴⁹ , Rhee ⁵⁰ , Shah ⁵¹

assessed the impact of the Triple A programme ^{47,48,51} .	also likely to be useful for other allergic conditions. There is the potential that peers model suboptimal behaviours; good selection and training processes are needed.	
Supporting the AYA, family and the wider community to allow the AYA inclusion in social events (e.g. sports, celebrations, holidays) may be considered (Grade D, Evidence level IV)		
<i>Strength of recommendation:</i> Weak recommendation based on low risk of bias in a cross-sectional study ⁵⁵ and qualitative studies ⁵²⁻⁵⁴ . These included AYA with either asthma ⁵³⁻⁵⁵ or food allergy ⁵² .	<i>Other considerations:</i> Aim for better participation, less bullying and gaining fitness. For example, there are sports, such as swimming, that less likely to trigger asthma. Adopting specific strategies may allow AYA with food allergy. or asthma to safely participate in trips, parties and other social events.	<i>References:</i> Winn ⁵⁵ , Mackenzie ⁵² , Mammen ⁵⁴ , Mammen ⁵³
Motivational interviewing can be recommended to improve asthma symptoms and quality of life (Grade B, Evidence level I)		
<i>Strength of recommendation:</i> Moderate recommendation based on one randomised controlled asthma trial ⁵⁶ . Motivational interviewing has been demonstrated to be effective across many areas and is likely to also be helpful with allergy.	<i>Other considerations:</i> This needs the active involvement of the AYA. Motivational interviewing includes strategies to increase motivation, shared decision making and goal setting.	<i>Reference:</i> Seid ⁵⁶

AYA, adolescents and young adults. HCP, Healthcare professional.

Addressing psychological issues (Table 4)

Many AYA with allergy and/or asthma have co-existing psychological issues, including anxiety, depression, suicidal ideation, and relational difficulties.^{33,57-74} These problems may magnify the complexities of self-management, care coordination and treatment planning in AYA with allergy and/or asthma. Therefore, the identification and management of psychological issues impacting disease control and health-related quality of life can be recommended (Grade B).

It is known that the social context of a person's life determines the risk of exposure, as well as their susceptibility, the course and outcome of illness.^{75,76} Socioeconomic factors and stressful life events can impact disease control^{34,77-81} and HRQL in allergic diseases^{64,70,82,83}. Therefore, the identification and management of socioeconomic issues and stressful life events impacting disease control and HRQL may be recommended (Grade C).

Where AYA are struggling to successfully self-manage their asthma, psychological interventions using a CBT based or multi-systemic therapy approach can be recommended to improve asthma knowledge, improve adherence, self-management and symptom control (Grade B).³⁹⁻⁴² This is based on a small number of randomised controlled asthma trials. Similar approaches are likely to be helpful where allergy is the key problem.

Table 4. Psychosocial recommendations for adolescents and young adults with allergy and/or asthma

Identification and management of psychological issues impacting disease control and health related quality of life can be recommended (Grade B, Evidence level II-III)		
<i>Strength of recommendation:</i> Moderate recommendation based on low risk of bias in quantitative cross-sectional ^{57,62,63,65-73} and quantitative cohort studies ⁶⁴ . These included AYA with asthma ^{57,62-64,68,71-73} , atopic dermatitis ^{65-67,69} and food allergy ⁷⁰ .	<i>Other considerations:</i> Many AYA with asthma and allergy have associated psychological issues. Tools such as HEADSS ²⁶ or YouthCHAT ^{84,85} may be helpful in identifying problems that can then be addressed and managed ⁸⁵ in an appropriate way.	<i>References:</i> Bruzzeese ⁵⁷ , Bruzzeese ⁷² , ⁷³ , Ferro ⁶⁴ , Halvorsen ⁶⁵ , Kim ⁶⁶ , Lee ⁶⁷ , Lu ⁶⁸ , Noh ⁶⁹ , Polloni ⁷⁰ , Shankar ⁷¹ , Hullmann ⁶³ .
Identification and management of socioeconomic issues and stressful life events impacting disease control and health related quality of life may be recommended (Grade C, Evidence level II-IV)		
<i>Strength of recommendation:</i> Moderate recommendation based on low risk of bias in quantitative cross-sectional ^{69,81,82} , quantitative cohort ^{64,79} and quantitative case series studies ⁸³ . AYA had asthma ^{79,81-83} , atopic dermatitis ⁶⁹ and food allergy ⁶⁴ .	<i>Other considerations:</i> Examples include factors that may impact on quality of life including divorce, bankruptcy, bereavement and recent severe allergic reactions. ^{69,82,83} Potential financial barriers should be explored in young adults. These areas need to be explored in a sensitive way.	<i>References:</i> Ferro ⁶⁴ , Hedman ⁸² , Am aral ⁸³ , Noh ⁶⁹ , Stridsma n ⁸¹ , Sundell ⁷⁹ .
Psychological interventions using a cognitive behavioural therapy based or multi-systemic therapy approach can be recommended to improve adherence, asthma knowledge, self-management and symptom control (Grade B, Evidence level I)		

<p><i>Strength of recommendation:</i> Moderate recommendation due to specific population^{39,41,42} based on low to intermediate risk of bias in one randomized controlled trial^{39,41,42,66} and a randomized pilot trial⁴⁰. Psychological interventions can be considered for AYA who are struggling to successfully self-manage their asthma.</p>	<p><i>Other considerations:</i> Evidence for asthma knowledge, self-management and symptom control, mainly involving African American AYA with asthma in one study^{39,41,42}. It is possible that findings may be extrapolated to other conditions. However, more studies are needed. These interventions are likely to be most effective for specific patients, for example those struggling to self-manage. The active involvement of the AYA is essential for success. The psychologist should have a good understanding of allergy and asthma.</p>	<p><i>References:</i> Naar⁴¹, Ellis³⁹, Naar-King⁴², Bruzzese⁴⁰.</p>
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AYA, adolescents and young adults; HEADSS (Home, Education/ Employment, peer group, Activities, Drugs, Sexuality, Suicide/ depression) assessment.

Obtaining support (Table 5)

Supportive relationships have been shown to have a positive impact on the management and control of asthma and/or allergic disease and in the overall well-being of AYA. Effective communication and fostering positive views about treatment can improve self-management, adherence, asthma control and quality of life.^{33,35,38,43,44,53,58,86-89} An unsupportive family environment has been associated with poor outcomes.⁸⁶ Adolescents tend not to report asthma symptoms to their parents and care-givers. Enrolling the family in assisting the AYA to undertake self-management of their asthma and allergy may be recommended (Grade C).^{33,35,38,43,44,53,58,86-89} This can be gradually achieved over time, as appropriate to the age of the AYA. Simple modifications to the family's routines to create time to take treatment may assist with adherence to therapy.^{43,44}

From early adolescence onwards, along with growing independence, relationships de-centralise from the core family to peers, friends and other social networks. Social comparison and being part of the group become increasingly important. As a result, the AYA may feel embarrassed about their allergy and/or asthma due to fear of being perceived as different from their peers. To prevent this, it may be recommended to encourage AYA to let their friends know about their allergy and/or asthma and how they can help in an emergency (Grade C).^{29,31,32,45,59} Friends may be invited to clinic appointments or practical workshops where they can be provided with hands-on training in symptom recognition, the use of adrenaline auto-injectors and other aspects of emergency management of allergy and asthma.^{29,31,32,45,59}

Promoting allergy and/or asthma awareness (e.g. triggers and treatment) among peers/ co-workers and teachers/ managers to support the AYA patient with self-management may be recommended (Grade C).^{33,45,61,62,90} Information about the nature of the allergic conditions, possible triggers and correct treatment may change their self-perception, and the perceptions of others, and enable improvement in self-management. Increased awareness may also help reduce allergy- and/or asthma-related bullying in schools and online.^{45,62,90}

Teenagers like to use applications on their mobile phones and look for information on the internet; moreover patients have reported finding online support networks

helpful.^{29,31,33,38,44,45,58-63,87,88} Signposting AYA to high quality reliable online resources about allergy and/or asthma (eg websites, moderated forums) where they can obtain age-appropriate information and advice may be recommended (Grade C).

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Table 5. Support recommendations for adolescents and young adults with allergy and/or asthma

Enrolling the family in assisting the AYA to take on the self-management of their allergy and asthma may be recommended (Grade C, Evidence level IV)		
<p><i>Strength of recommendation:</i> Moderate recommendation based on low to moderate risk of bias in qualitative^{33,35,44,53,88} and observational studies^{38,43,58,86,87,89}.</p> <p>These included AYA with both asthma^{33,35,38,43,44,53,86,87,89} and food allergy^{58,88}.</p>	<p><i>Other considerations:</i> Support the family to slowly empower the AYA to take on more self-management as appropriate to the individual balancing autonomy and safety. Reducing control may be a challenge for some parents.</p> <p>Ask the AYA how they would like their parents/carers to be involved throughout their transition and help them develop confidence in working with the adult's services¹⁸. Give AYA the chance to raise any concerns and queries separately from their parents/ carers respecting their confidentiality and autonomy. This may take more clinic time.</p> <p>Adherence may be improved if the family's routines are modified to assist AYA self-management activities^{43,44}.</p>	<p><i>References:</i> Bruzzese⁸⁹, Bruzzese⁴³, Holley³³, Koster³⁸, Mammen⁵³, Naimi³⁵, Rhee⁸⁶, Rhee⁸⁷, Steensgaard⁵⁸, Stewart⁸⁸, Wamboldt⁴⁴.</p>
Encouraging AYA to let their friends know about their allergy and asthma and how to manage emergencies may be recommended (Grade C, Evidence level IV)		
<p><i>Strength of recommendation:</i> Moderate recommendation based on low to moderate risk of bias in qualitative^{32,59} and observational studies^{29,31,45}. These included AYA with asthma³², anaphylaxis⁵⁹ and food allergy^{29,31,45}.</p>	<p><i>Other considerations:</i> Some AYA may find this difficult, they may require support and be encouraged to initially just talk to a few close friends.</p> <p>Provide practical training in symptom's recognition, the use of adrenaline autoinjectors and other aspects of emergency management</p>	<p><i>References:</i> Gallagher⁵⁹, Jones²⁹, Jones³¹, MacAdam³², Warren⁴⁵.</p>

	for friends. Some AYA may want to bring a friend to the clinic for support.	
Promoting allergy and asthma awareness (e.g. triggers and treatment) among peers/ co-workers and teachers/ managers to support the AYA patient with self-management may be recommended (Grade C, Evidence level IV)		
<i>Strength of recommendation:</i> Moderate recommendation as based on low risk of bias in qualitative ^{33,61} and one observational study ⁴⁵ . These included AYAs with both asthma ³³ and food allergy ^{45,61} .	<i>Other considerations:</i> Efforts should be made to reduce asthma and allergy related bullying especially in schools ^{45,62,90} and online ⁶² .	<i>References:</i> Fong ⁹⁰ , Gibson-Young ⁶² , Holley ³³ , Monks ⁶¹ , Warren ⁴⁵ .
Signposting AYA to high quality online resources about allergy and asthma (websites, moderated forums) where they can obtain age-appropriate information and advice may be recommended (Grade C, Evidence level IV)		
<i>Strength of recommendation:</i> Moderate recommendation based on low to moderate risk of bias qualitative ^{33,44,59-61} and observational studies ^{29,31,38,45,58,62,63,87,88,91} . These included AYA with asthma ^{33,38,44,60,62,87,88} , anaphylaxis ⁵⁹ , allergy ⁹¹ and food allergy ^{29,31,45,58,61,63} .	<i>Other considerations:</i> Patients consider online supportive networks to be helpful. Peer support groups may be helpful, for example, voluntary- and community-sector organisations, such as condition specific support groups or charities ^{13,18} . Social networks via virtual platforms or electronic communication may be helpful ^{13,18} . Moderation of the group is desirable to ensure that interactions within the group are positive.	<i>References:</i> Bruzzese ⁴³ , Gallagher ⁵⁹ , Gibson-Young ⁶² , Hullmann ⁶³ , Holley ³³ , Jones ²⁹ , Jones ³¹ , Jonsson ⁶⁰ , Koster ³⁸ , Monks ⁶¹ , Rhee ⁸⁷ , Stewart ⁸⁸ , Steensgaard ⁵⁸ , Suorsa ⁹¹ , Warren ⁴⁵ Wombald ⁴⁴ .

AYA, adolescents and young adults.

DISCUSSION, GAPS IN THE EVIDENCE AND FUTURE PERSPECTIVES

Discussion

The EAACI Task Force on Adolescents and Young Adults has developed an evidence-based, clinical practice guideline to help HCP to manage AYA with allergy and/or asthma. Adolescence can be a critical time for AYA as they need to become independent, expert adult patients, successfully self-managing their chronic conditions. This can be seen as a challenge but also as an opportunity for HCP. This is because neurodevelopmentally, adolescents are naturally eager to become more autonomous and are able to learn new skills quickly and easily.

The guideline sets out a series of general recommendations focused on how to run a clinical service for AYA. Key recommendations are to consider starting transition early (11-13 years), using a structured, multidisciplinary approach (involving both paediatric and adult clinics where applicable); ensuring AYA fully understand their condition(s) and have resources that they can access; discussing any implications for self-management in real-world contexts such as further education/work and actively monitoring adherence. Specific allergy and/or asthma transition recommendations are categorised according to improving adherence, optimising self-management, addressing psychological issues and obtaining support. Highlights include simplifying medication regimes and the use of reminders; focusing on areas where AYA are less confident; involving peers in training AYA patients; identifying and managing psychological and socioeconomic issues impacting disease control and quality of life; enrolling the family in assisting AYA to take on self-management and encouraging AYA to let their friends know about their allergy and asthma.

Limitations

Based on the recent survey, we know that there is a lack of adult allergy services, as well as availability of HCP with a specific expertise (psychologists and dieticians) in many European countries². There is a need for an individualized and coordinated transition process between the AYA, family and medical services to ensure the best outcomes. This needs to be multidisciplinary including medical, nursing, dietetic, psychology and other staff. It is important to note that most

of the evidence about transition, challenges and interventions in AYA with allergy and/or asthma comes from cross-sectional and qualitative studies. While many of these studies are high quality with low risk of bias, they do not represent a robust form of evidence.

How to implement transition (Box 3)

Transition needs to be implemented as a joint approach from paediatric and adult services. The process is simpler where the allergy service caters for all age groups but a separate AYA transition clinic is still helpful to facilitate a smooth transition care process which addresses the age and developmental specific needs for AYA, that has been shown to be successful in different diseases⁹²⁻⁹⁵. As most HCP have received only minimal specific training on how to manage this age group, this is likely to require additional staff training in delivering developmentally appropriate healthcare (Table 6). Information technology may be helpful in implementing additional support for this AYA group⁹⁶. Some of the likely barriers and strategies facilitated to delivering a transition service for AYA are detailed in Table 7. The task force is now working on practical tools for assisting healthcare professionals to implement transition for allergy and asthma.

Box 3. Practical considerations to delivering an adolescent and young adult allergy and/or asthma clinic

- Ensure that the AYA service is a joint activity between paediatric and adult services
- Use an adolescent and young adult- centred approach
- See AYA on their own for part of the clinic
- Ensure that the AYA is an active participant in the consultation
- Talk through barriers to self-management with the AYA and help them to come up with solutions, e.g. alarms on mobile phone to remind them to take medication
- Education directed at AYA (and their peers) rather than their parents/carers
- Enroll parents and rest of family to support AYA to take on self-management of their allergy and asthma
- Encourage AYA to let their friends know about their allergy and asthma
- Utilize peer support groups
- Role play managing an allergic reaction or asthma attack
- Practice with dummy adrenaline autoinjector / asthma inhaler
- Use a personalized written management plan – AYA may find it easier to keep it as a photo on their mobile phone

Selection of helpful resources:

- Centre for Health Care Transition Improvement. Got transition program. 2014. Available at: <https://www.gottransition.org/resources/index.cfm> (last accessed 4th April 2020).
- ON TRAC (Transitioning Responsibly to Adult Care). Available at: <http://ontracbc.ca/> (last accessed 4th April 2020).
- Good 2 Go Transition Program. Available at: <http://www.sickkids.ca/patient-family-resources/resource-navigation-service/transitioning-to-adult-care/index.html> (last accessed 4th April 2020).
- Checklist for readiness: <http://www.sickkids.ca/PDFs/good2go/41196-Patient%20readiness%20checklist.pdf> (last accessed 4th April 2020).
- Nagra A, McGinnity PM, Davis N, et al. Implementing transition: Ready Steady Go. Archives of Disease in Childhood - Education and Practice 2015;100:313-320.
- Children & Young People's Allergy Network Scotland Young People's. 2019. Transition Pathway to Independent Self-Management of Allergies. Available from: <https://www.cyans.scot.nhs.uk/wp-content/uploads/2019/10/Transition-allergy-pathway-v1.1.pdf?x54518> (last accessed 4th April 2020).
- UK NHS toolkit: <https://www.northumbria.nhs.uk/quality-and-safety/clinical-trials/for-healthcare-professionals/> (last accessed 4th April 2020).
- AYA app: <https://www.yphsig.org.uk/resources-1> (last accessed 4th April 2020). UK NHS toolkit: <https://www.northumbria.nhs.uk/quality-and-safety/clinical-trials/for-healthcare-professionals/> (last accessed 4th April 2020).
- AYA app: <https://www.yphsig.org.uk/resources-1> (last accessed 4th April 2020).

Other useful resources are available from local allergy and asthma organisations.

Recommendations for policy and training

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This guideline has important implications for policy makers, managers and commissioners of both paediatric- and adult-centred care in allergy and/or asthma patients. The recommendations could be implemented at a patient, family and society level, through education, training, resources and service delivery design.⁹⁷ Based on the recent survey, HCP find managing AYA to be a challenge². Therefore, it would be helpful to implement training in the generic transition process in undergraduate and postgraduate training programmes (Table 7). Commissioners need to focus on and understand the important components of integrated AYA care that can be shown to improve outcomes.⁹⁸ Self-management is a core component of transition. It is associated with cost savings, a more sustainable health system with less utilisation of health services and subsequent easing of workforce pressures⁹⁹. Promoting self-management is in line with international health policy aims which support a 'life course approach and people empowerment'.¹⁰⁰

Gaps in the evidence

Our systematic review summarizes the sizable amount of evidence for the challenges experienced by AYA with allergy/or and asthma⁷. Specific gaps are notable in food allergy, particularly around adherence to dietary restrictions, label reading and cooking skills in AYA. The evidence gaps are predominately in relation to intervention strategies for allergy as the systematic review only found interventional asthma studies⁸. Evidence is urgently needed to help determine the best format for an AYA transition clinic and for the most effective and cost-effective interventional strategies for allergy and asthma (Table 8).

Conclusions

The EAACI Task Force on Adolescents and Young Adults presents recommendations to support the development of a transition clinic for adolescents and young adults with allergy and/or asthma. This should support HCP to help AYA develop into competent and confident adult patients who can successfully self-manage their allergy and/or asthma. Special emphasis is placed on the difference between transition and transfer. Transitional care is required even when AYA are managed in an allergy clinic dealing with all age groups. While it is possible to make evidence-based recommendations, the evidence for some is minimal. Larger, well

designed, randomised controlled trials are required in this area. If optimal care is delivered for AYA, they should become expert adult patients with the knowledge and skills to manage their allergy and/or asthma throughout their lives.

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Table 6. Training requirements for HCP working with AYA with allergy and asthma

Knowledge	Skills
<ul style="list-style-type: none">• An understanding of AYA development including physical, psychological, cognitive and emotional aspects• An understanding of the lifestyle of AYA such as education, vocation, employment, work, sports, recreation and future vision• An understanding of AYA relationships both inside and outside the family• A knowledge of allergic diseases and asthma management in adolescence and young adulthood	<ul style="list-style-type: none">• Skills and knowledge to address emotional, mental health and social issues• Skills to assess adherence and assist AYA to improve this• Skills and knowledge to recognise and deliver behavioural change for common risk-taking behaviours in the adolescence and young adulthood• Communication skills (with parents/carers and AYA), promotion of self-management and shared decision making

AYA: adolescents and young adults. HCP, Healthcare professional.

Table 7. Implementation: barriers, facilitators, audit criteria and resource implications

Recommendation areas	Barriers to implementation	Facilitators to implementation	Audit criteria	Resource implications
Implementation of a structured, multidisciplinary transition programme involving paediatric and adult HCP for 11-25 year age group	Organization challenges reorganising service to deliver a paediatric/ adult clinic.	Training for staff, checklist of skills and knowledge for AYA patients, regular meetings between adult and paediatric teams, audit process.	Existence of a 11-25 year transition clinic.	Some initial investment may be required to reorganise the clinical service.
Medication reminders, mobile applications and web-based applications, monitors or routines to improve adherence, symptom control and quality of life	Convincing families to change their routines. Expense of information technology applications or monitors.	The use of alarm functions on devices such as mobile phones.	Adherence to therapy.	Simple changes to routines to facilitate adherence or the use of alarm functions on devices such as mobile phones are inexpensive. Separate mobile or web-based applications would be expensive.
Focusing consultation on areas where AYA say they are not confident to improve self-management including adherence	Changing HCP approach which focuses on a set approach to history taking in clinic.	Training for HCP so they understand the mind set of AYA and behavioural change approaches.	Survey of AYA patients to assess their confidence in self-management.	Resources for training HCP.

Formulation of a personal action plan with the AYA and their family to enable them to self-manage their allergy and asthma	Time to develop patient specific self-management plans.	Generic personal action plans that can be personalised to the needs of specific patients.	Possession of personal action plan by individual patients.	Time to develop patient specific self-management plans.
Peer-led interventions to improve asthma related quality of life, asthma knowledge and to reduce asthma related doctor visits and school absence	Resistance and expense of involving peers in training AYA. Availability of peers who have the same condition.	Education of HCP about the benefit of peer-led interventions.	Asthma related quality of life and control after peer-led interventions.	Expense of involving peers in training AYA.
Supporting the AYA, family and the wider community to allow the AYA inclusion in social events	Resistance from teachers, sport club leader and others in the community.	Education of teachers, sport club leader and others in the community as to how to safely manage the risks associated with allergy and asthma.	Access to social events by patients with allergy and asthma.	Costs associated with training and education.
Motivational interviewing to improved asthma symptoms and quality of life	Lack of time and expertise.	Training for HCP and knowledge about how improved self-management can reduce further healthcare utilisation.	Asthma related quality of life and control after use of motivational interviewing.	Expense of training and increased clinic time, initially.

Identification and management of psychological and socioeconomic issues impacting disease control and health related quality of life	Lack of time in clinic to identify and assist in managing these.	Training in AYA care and awareness of importance of psychological and socioeconomic issues.	Survey of psychological and socioeconomic issues.	Cost of additional clinic time. Access to a psychologist within the allergy service.
Psychological interventions using a cognitive behavioural therapy based or multi-systemic therapy approach to improve adherence, asthma knowledge, self-management and symptom control	Lack of time and expertise.	Training for HCP and knowledge about how improved self-management can reduce further healthcare utilisation.	Health related quality of life and symptom control after use of these psychological interventions.	Expense of training and increased clinic time, initially. Access to a psychologist within the allergy service.
Enrolling the family in assisting the AYA to take on the self-management of their allergy and asthma	Inflexible family routines and lack of time.	Involvement of families in clinic and explanation of benefits of their support.	Health related quality of life and symptom control after use of these psychological interventions.	Cost of possible additional clinic time.
Encouraging AYA to let their friends know about their asthma and allergy and how to manage emergencies	AYA embarrassment and concern that they will be seen as different.	Explanation that friends will be interested in helping them.	Survey of the involvement in friends in	Cost of possible additional clinic time. Plus resources directed at friends.

			supporting self-management.	
Signposting AYA to high quality online resources about allergy and asthma where they can obtain age-appropriate information and advice may be recommended	Information on websites or from forums that provided an inaccurate picture of allergy and asthma.	High quality websites or moderated forums that can inform and support AYA with allergy and asthma.	Survey the use of website and moderated forum.	Costs associated with developing and maintaining websites and moderated forums.

AYA: adolescent and young adult. HCP: healthcare professionals.

Table 8. Research gaps in the transition management of adolescent and young adults with allergy and asthma

Research gap	Plan to address	Priority
Effectiveness and cost-effectiveness of different transition formats for allergy and asthma – should include patient and parent perspectives with quantitative and qualitative outcomes	Cluster randomised controlled studies focused on different clinic formats with a process evaluation to assess which components are most important	High
Effectiveness and cost-effectiveness of educational interventions for AYA with allergy and asthma	Randomised controlled trials with a process evaluation to assess which components are most important	High
Effectiveness and cost-effectiveness of motivational interviewing for allergy and asthma	Randomised controlled trials	High
Effectiveness and cost-effectiveness of psychological interventions (eg CBT) for allergy and asthma	Randomised controlled trials	High
Smart phone applications or other information technology interventions to improve self-management in AYAs with allergy and asthma	Large randomised controlled trials as follow on from current small pilot studies ³⁸	High
The best time for the transfer of responsibilities of care for each facet to management	Cross sectional studies looking at competence to deliver each facet of management at different ages	Medium
Development and validation of disease-related knowledge/ transition readiness tools for AYA with allergy and asthma	Projects using standard questionnaire development and validation principles	Medium

Most effective way of training HCP in AYA management	Randomised controlled trials of different training modalities with a process evaluation to assess which components are most important	Medium
Value of personal actions plans for AYA to improve outcomes in allergy	Randomised controlled trials	Medium
Value of patient activation measures in allergy and asthma	Randomised controlled trials	Medium
Role of the identification and management of psychological and socioeconomic issues in AYA to improve health related quality of life and disease control	Randomised controlled trials with a process evaluation to assess which components are most important	Low
Strategies to successfully enrol AYA friends to support self-management	Qualitative studies to develop an intervention with small follow on pilot study	Low

AYA: adolescents and young adults. CBT: cognitive behavioural therapy. HCP: healthcare professionals.

ACKNOWLEDGEMENTS

The EAACI Adolescent and Young Adult Task Force would like to thank Paula Sands for her advice with the literature search; Paula Fernandez for generating the logo; Marina Atanaskovic-Markovic, Barbara Ballmer-Weber, Knut Brockow, Helen Brough, Adam Fox, Karin Hoffmann-Sommergruber, Chrissie Jones, Antti Lauerma, Liam O'Mahony, Donald Payne, Joaquin Sastre, Jurgen Schwarze, Terry Segal, Isabel Skypala, Gunter Sturm, Ingrid Terreehorst, Maria Jose Torres and Eva-Maria Varga for their constructive, expert review of the draft guidelines; Susanne Halken, Mary Jane Marchisotto, Glenis Scadding and Emilia Vassilopoulou for reviewing the guideline on behalf of EAACI Guidelines Committee; the EAACI Methodology Committee for their expert feedback; all the EAACI members who commented on the draft guideline via the public web site; Ana Antunes for her assistance and EAACI for funding the generation of the guideline. We would like to thank Millie Basu, Lea Blum, Anna Borushko, Davide Caimmi, Antoine Deschildre, Amandine Divaret-Chauveau, Anastasiya Kolotilina, Sarah Lyons, Sonia Martin-Pereda, Maura Pedrini and Lea Tammen, for assisting in generating different language versions of the adolescent and parent survey. We would like to thank the following for distributing the survey: Federasma e Allergie Onlus; Associazione Respiriamo Insieme; Associazione Laziale Asma e Malattie Allergiche (ALAMA); Associazione Liguri Allergici (ALA); Associazione Asma Sardegna Onlus; Cibo Amico Associazione per le Allergie Alimentari e l'Anafilassi; Associazione Nazionale Dermatite Atopica (ANDeA); Associazione Food Allergy Italia; APS Chiara Ribechini; Uniamo Federazione Italiana Malattie Rare onlus, Ari-aaa3 ONLUS; Società Italiana di Allergologia e Immunologia Pediatrica (SIAIP); Società Italiana di Allergologia; Asma e Immunologia Clinica (SIAAIC); Montserrat Alvaro, Jaime Lozano, Joan Bartra, Fundación Humans, Fundación Lovexair, Edryx Healthcare; patients and parents from the pediatric allergy unit of the University Hospital Vall d'Hebron, Barcelona; patients and parents from Centre Mèdic del Berguedà and Gabinet Mèdic del Berguedà, Berga, Barcelona; Institut Vescomtat de Cabrera, Hostalric; Institut Blanca d'Anjou, El Perelló; Societat Catalana d'Al·lèrgologia i Immunologia Clínica (SCAIC); Sociedad Española de Inmunología Clínica y Alergología Pediátricas (SEICAP); Sociedad Española de Alergología e Inmunología Clínica (SEAIC); Lara Pimenta; Mário Morais Almeida; Andre Moreira (EAACI SPC Chair), Portuguese Association of Asthmatics; Deutscher Allergie- und Asthmabund

(DAAD) (Sabine Schnadt), Mönchengladbach, Germany; Daniel Munblit; Maria Kardakova; 'Аллергомамы', 'АтД по-доказательному' (Anna Taranova); Danish patient organization; Asthma Allergy Denmark; Nederlands Anafylaxis Netwerk; Allergy UK (Carla Jones); Anaphylaxis Campaign (Lynne Regent); Hilary Allen; Aideen Byrne; John Fitzsimons; Antoine Deschildre; Amandine Divaret-Chauveau; "Association Asthme et Allergies" (Christine Rolland); "AFPRAL" (Pascale Couratier); Elena Bradatan; Virginie Doyen; and Swiss patient organization. Finally we would like to thank all the patients and parents who completed the survey. The systematic review of the generic adolescent and young adult data were undertaken by Ekaterina Khaleva as part of her Allergy MSc (University of Southampton).

AUTHOR CONTRIBUTIONS

Guideline concept and design: G.R., M.V-O., KK. Acquisition of data including search, all authors. Analysis and interpretation of data, all authors. Critical revision of the manuscript for important intellectual content, all authors. Obtained funding, G.R., M.V-O.

CONFLICT OF INTEREST

GR and RK report research funding from Asthma UK and National Institutes of Health Research into the challenge associated with asthma during adolescents. FT reports being a parent of a young adult with food allergy. None of the other authors have anything to disclose.

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