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Review Article

Summary of the European Association of Urology/European Society of paediatric urology guidelines on transition in urology

Martin Skott [a], Michele Gnech [b], Anna Bujons [c], Lisette ’t Hoen [d], Berk Burgu [e], Yazan F. Rawashdeh [a], Guy Bogaert [f], Josine Quaedackers [g], Niklas Pakkasjärvi [h], Allon van Uitert [i], Uchenna Kennedy [j], Yuhong Yuan [k], Christian Radmayr [l], Marco Castagnetti [m], Fardod O’Kelly [n,*]

Summary

Objective
To provide a chapter on transition and the importance of long-term follow-up for congenital conditions in urology to the European Association of Urology (EAU) and European Society for Paediatric Urology (ESPU) Guidelines.

Methods
A structural literature search was performed by a librarian and reviewed by at least two panel members for all relevant publications between February 1974 to February 2024.

Results
Transition programs should be personalised to each patient’s needs and structured to encourage patients’ ownership of their health as they mature. Start transition at the onset of adolescence involving both paediatric and adult urology providers in a multidisciplinary approach to ensure better transition readiness and subsequent adult clinic adherence. Use a validated transition assessment tool to objectively assess for transition readiness.

Conclusion
This paper is a summary of the 2025 EAU/ESPU Guidelines on transition in urology. While the data supporting these recommendations were retrieved using a standard and solid methodology developed by the EAU Guidelines Office, the strength of the recommendations remains currently somewhat limited by the paucity and quality of the literature available.

* Correspondence to: Fardod O’Kelly, Division of Paediatric Urology, Beacon Hospital & University College Dublin, Ireland
martinskott24@gmail.com (M. Skott)
michele.gnech@policlinico.mi.it (M. Gnech)
abujons76@gmail.com (A. Bujons)
l.thoen@erasmusmc.nl (L. Hoen)
berkburgu@gmail.com (B. Burgu)
yazan.rawashdeh@rm.dk (Y. F. Rawashdeh)
guy.bogaert@uzleuven.be (G. Bogaert)
j.s.l.t.quaedackers@umcg.nl (J. Quaedackers)
niklas.pakkasjarvi@gmail.com (N. Pakkasjärvi)
Allon.vanUitert@radboudumc.nl (A. van Uitert)
Uchenna.Kennedy@kispi.uzh.ch (U. Kennedy)
yyuan@mcmaster.ca (Y. Yuan)
christian.radmayr@i-med.ac.at (C. Radmayr)
marco.castagnetti@unipd.it (M. Castagnetti)
fardod.okelly@ucd.ie, fokelly@rcsi.ie (F. O’Kelly)

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[a] Department of Urology, Section of Pediatric Urology, Aarhus University Hospital, Aarhus, Denmark [b] Department of Paediatric Urology, Fondazione IRCCS Ca’ Granda, Ospedale Maggiore Policlinico, Milan, Italy [c] Division of Pediatric Urology, Urology Department Fundació Puigvert Universitat Autonòma Barcelona, Spain [d] Department of Pediatric Urology, Erasmus Medical Center, Rotterdam, the Netherlands [e] Department of Pediatric Urology, Ankara University School of Medicine, Ankara, Turkey [f] Department of Urology, University of Leuven, Leuven, Belgium [g] Department of Urology, University Medical Center Groningen, Groningen, the Netherlands [h] Dept of Pediatric Surgery, New Children’s Hospital, Helsinki University Hospital, Finland & University of Turku, Faculty of Medicine and Vaasa Central Hospital, Helsinki, Finland [i] Department of Urology, Radboud University Medical Centre, Nijmegen, the Netherlands [j] Department of Pediatric Urology, University Children’s Hospital Zurich, Switzerland [k] Department of Medicine, McMaster University, Hamilton, Ontario, Canada [l] Department of Urology, Medical University of Innsbruck, Innsbruck, Austria [m] Division of Pediatric Urology, Bambino Gesù Children Hospital, Rome, Italy [n] Division of Paediatric Urology, Beacon Hospital Dublin & University College Dublin, Ireland

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Introduction

This publication is a summary of the chapter on transition in urology from the European Association of Urology (EAU) and European Society for Paediatric Urology (ESPU) 2025 Guidelines [1]. Prescriptive literature on transition in urology is still limited and thus the level of evidence is generally low [2]. Therefore, it is unfortunately not possible to produce recommendations that are based on high-quality studies, thus making this topic difficult to study [3].

Definition

Transition in urology is defined by the process where an adolescent with a congenital or acquired urogenital anomaly is prepared for transition into adult services in order to allow them to assume greater responsibility and independence for their own health care decision making as an adult. The main goal of the transition process in urology is to preserve renal function, to optimize quality of life, to treat and manage issues related to sexual function, sexual health, fertility and continence, and to monitor for progression of the disease process or complications related to prior interventions [4–6]. Equally important is the concept of lifelong urological care which is encompassed by congenital lifelong urology and should automatically be instigated after appropriate transition. The two concepts are often used interchangeably, and whilst distinct are heavily intertwined, thus both are discussed as part of the EAU guidelines on this subject.

Barriers to transition

Transitioning from paediatric to adult care in urology is a personal journey, often influenced by individual factors such as physical and emotional maturity, the complexity of the condition, and the presence of additional disabilities. System level barriers include insurance/socioeconomic status, poor communication between paediatric and adult care teams, a lack of specialised adult urologists with expertise in congenital conditions, the absence of formal transitional urology clinics and training, and a lack of standardised care guidelines for patients transitioning to adult care. The adolescent, caregivers and health care providers often have different views and expectations during transition. Adolescents expect to be more like their able-bodied peers and experience changes due to puberty, including the willingness to participate in health care agreements. Concurrently, paediatric urologists may opt to increase the number of visits to enable a smoother transition to the adult urologist, without any significant outstanding therapeutic issues. Patients may be reluctant to be discharged by the paediatric urologist with whom they had a longstanding relationship.

Finding an adult urologist skilled in complex reconstructive urology and familiar with congenital urological issues can be challenging. The adult urologist must be focused on the overall care of the patient and be able to work in a multidisciplinary team to fill in the gaps of each individual discipline. Strong lines of communication between relevant specialists are essential (e.g., nephrology, neurosurgery, gynaecology, rehabilitation doctors, orthopaedics and sexology) [7–9]. Specific key features have been identified that can pose difficulties in the transition process (Table 1).

This issue is not limited to urology, with other transitional programs established for epilepsy, diabetes, cardiology, leukaemia, and cystic fibrosis, highlighting a disparity for adolescents in urology. Historically in transplantation, about 35 % of young adults lose a successfully functioning kidney transplant within 36 months of transfer from paediatric to adult services. The development of a dedicated transition service to adult care has led to improved patient adherence to regular medication and engagement with healthcare providers, with a significant reduction in transplant rejection rates [10]. This was corroborated by a study from Switzerland which demonstrated that their standardised multilevel transition program had a significant positive effects on eGFR and a decrease in acute rejection episodes by 25 % in renal transplant patients based on multiple regression analysis [11]. Similarly the TRANSNephro trial from Germany and Austria showed that more than half of the patients had mean coefficient of variation of immunosuppression trough levels consistent with good adherence [12]. It was however, subsequently shown that being aware of patients' neurocognitive development, mental well-being, and social determinants of health, as with liver and intestinal transplant programs is also important to establish a patient-focused program [13] (Table 2).

Table 1 Key structural differences between paediatric and adult care that can pose difficulties in the transition process (adapted from Claeys et al., 2021) [5].

Feature	Paediatric care	Adult care
Patient management	Involvement of a large multidisciplinary team, often lead by a single provider (referrals within the team)	Smaller teams with subspecialty expertise (referrals to other specialties as needed)
Care approach	Family centred	Patient centred
Patient functioning	Limited independence	Expected independence
Clinic management	Time allotted for detailed discussion with intensive coordination	Usually, shorter appointment times and focused care coordination
Access to psychology	Good access	Often limited access
Follow-up	Regular active follow-up	More passive follow-up

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In adolescents and young adults undergoing cancer care, a similar focus on transition to adult services has been adopted with the development of European guidelines as a result of adult survivors of childhood cancer not always being engaged in recommended health promotion and follow-up practices [14]. Associates of engagement in adult care are complex, representing social-ecological variables. Thus, standard measures of transition readiness may not adequately identify targets of intervention to promote successful transfer of care and therefore identifying these at-risk patients through design interventions are critical [15].

Methods

The EAU/ESPU guidelines are unique among guidelines in that they include all paediatric urology conditions subdivided into chapters. In general, five to six chapters are updated each year and occasionally new chapters are added. In the 2025 version of the guidelines a new chapter on transitional urology is added. A structural literature search was performed by a librarian and reviewed by at least two panel members for all relevant publications between February 1974 to February 2024. Only English publications were eligible for inclusion. Conference abstracts were excluded. The literature search was performed using the following databases: MEDLINE, Embase, and Cochrane Central Register of Controlled Trials (CENTRAL). We searched for Medical Subject Headings (MeSH) terms and free text words. A comprehensive search strategy for each database is provided in Supplement 1.

Guidelines' recommendations are developed by expert panels to prioritize clinically significant care decisions. The strength of each recommendation is determined by several factors, including the balance between benefits and risks of different management strategies, the quality and certainty of the evidence, and the variability in patient values and preferences [2]. Strong recommendations typically reflect high-quality evidence and/or a clear favorable balance of benefits over harms, with strong patient preference. Weak recommendations often indicate lower-quality evidence, an uncertain benefit-risk balance, or variability in patient preferences [3]. Additional information can be found in the general Methodology section online at the EAU website; https://uroweb.org/eau-guidelines/methodology-policies (Table 3).

Table 2 Summary of evidence for Transitional Care.

Summary of evidence	LE
There are several paediatric urological conditions requiring long-term following up which would be unfamiliar to solely adult-trained urologists.	4
Involvement of paediatric and adult paediatric urologists working in a multidisciplinary team with expertise in the management and treatment of congenital conditions is essential.	4
Assessment of readiness may be formalised using readiness assessment questionnaires completed by both the child and caregivers to provide insight into their ability to cope with the transfer process and, therefore, represents a way of determining when the right time is for them to transition to adult services.	4
A gradual introduction of the adult urologist into the health care team, several years before targeted time of transition, may facilitate the transition.	4

Table 3 EAU/ESPU recommendations.

Recommendations	Strength rating
Develop a standardized transition-of-care program and collaborate with adult providers to facilitate safe, successful, and sustainable transition.	Strong
Start transition at the onset of adolescence involving both paediatric and adult urology providers in a multidisciplinary approach to ensure better transition readiness and subsequent adult clinic adherence.	Weak
Use a validated transition assessment tool to objectively assess for transition readiness.	Strong

Results

The transition process

The optimal age at which patients should transition into the care of adult providers has not been firmly established and may need to be individualised to the patient based on their unique situation. Overall, it is important to address transitional care from the age of 12 years and by 16 years at the latest. A gradual introduction of the adult urologist into the health care team, several years before targeted time of transition, may facilitate the process of transfer to a new provider, as the child and the caregivers gain trust in the new provider [16]. During the adolescent years, transition preparation should focus on creating a comprehensive care plan, providing decision-making support and fostering self-management skills [17].

Various models of a transition programs have been proposed. However, no single approach has been demonstrated as superior [18]. The National Alliance to Advance Adolescent Health (https://www.gottransition.org/six-core-elements) has identified six core elements to support transitional care across specialties (Fig. 1). For each element, several measures are proposed in order to allow for a successful transition to adult care. An ideal age for completion of each step is only a reference and may require adjustment based on the developmental stage of the child. The system of transitioning to adult services in the United States has been in operation since 2005 and implements a series of self-assessment forms such as 'Ready Steady Go' (RSG) that the adolescent patient uses to self-assess their care needs, and to assess how they feel these are being met. It uses a traffic light system 'Ready' (red), 'Steady' (yellow), 'Go' (green). The form identifies eight sections — Knowledge, Self-Advocacy, Health and Lifestyle, Daily living, Education and your future, Leisure, Managing your emotions and Transfer to adult care [19].

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Assessment of readiness may be formalised using readiness assessment questionnaires completed by both the child and caregivers to provide insight into their ability to cope with the transfer process and, therefore, represents a way of determining when the right time is for them to transfer to the adult health-care providers [7,8].

Specific genitourinary conditions requiring long-term follow up following transition

Neurogenic bladder

The most common cause for neurogenic bladder/bowel dysfunction in an adolescent is spinal dysraphism, of which myelomeningocoele is the most prevalent[11]. With advances in neonatal and paediatric care, 50–94 % of infants born with spina bifida are now estimated to survive into adulthood [20]. This means that adult urologists are increasingly encountering these patients and are tasked with managing the urological manifestations of this condition and/or its treatments.

A joint study from Utah and Minnesota demonstrated that 77 % of patients were performing clean intermittent catheterisation, with 84.6 % having an identified urological problem, with bothersome urinary incontinence affecting 52 % of patients [21]. Another study demonstrated that following attendance at a transitional care clinic for spina bifida, 71 % of adolescent/adult patients required changes in bladder management and 38 % underwent a major surgery [22]. Specific urological issues at transition require surveillance and management of renal function, urinary incontinence, urinary tract infections, bowel function, sexual function, urolithiasis, and complications from urinary tract reconstruction [23]. The risk of bladder cancer following augmentation in children appears to be very low, however the data from a systematic review analysing this data was only able to include two studies with more than 5

Policy/Guide
Develop a specific transition policy statement and disseminate to the staff.
AGE 12-14

Tracking & Monitoring
Establish criteria to identify patients ready to begin transition and institute a reproducible monitoring process.
AGE 14-18

Readiness
Assess transition readiness with present and future care plan construction. This should involve patient and family caregivers.
AGE 14-18

Planning
Update of readiness assessment and discussion of timing as age 18 approaches. Identification of adult provider.
AGE 14-18

Transfer of care
Document assembly for patient and new provider. (ideally during a period of condition stability)
AGE 18-21

Transfer completion
Follow up between paediatric and adult provider for feedback and/or consultation.
AGE 18-23

Fig. 1 Six core elements to support transition care across specialties (adapted from https://www.gottransition.org/six-core-elements.

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years follow-up. Therefore, long-term oncological outcomes remain uncertain [24]. Studies indicate that transition readiness is delayed, and the process of transition takes longer in spina bifida patients when compared to other adolescent with congenital of acquired urogenital anomalies [25—28]. Barriers to a successful transition in this cohort are due to low compliance, financial difficulties and lack of utilization of community services [29,30].

Several studies have shown improved outcomes in spina bifida patients who have undergone formal transition compared to an *ad hoc* referral to adult services, with much of this data currently originating from North America. A study from Texas demonstrated the improved the use of a bowel regimen at the time of transfer to adult care and better planning regarding decision-making and transportation to clinic appointments [31]. In another study from Michigan it was shown that females were more likely to attend clinics than males following transition to adult services, and that those who did not transition to adult care had similar outpatient visit types but higher utilization of inpatient and emergency care [32]. Overall, successful transition of spina bifida patients results in a relative decrease in unplanned hospital admissions, unplanned outpatient clinic attendances, and preventable emergency department visits [33].

Posterior urethral valves (PUV)

Despite early intervention, many PUV patients have inherently abnormal bladders. The ‘valve bladder’ is a progressive condition that continues to evolve over years, despite surgically alleviated bladder outlet obstruction during infancy. Clinically, urinary incontinence or polyuria can be present. Furthermore, there can be poor bladder compliance, detrusor overactivity, vesico-ureteral reflux, ureterovesical junction obstruction or myogenic failure of the bladder [8,34]. It is essential to the adult urologist to recognise risk factors for progressive lower urinary tract dysfunction (dilatation of upper urinary tract, progressive loss of renal function, detrusor non-compliance etc.) in adult men with PUV. Life-long monitoring, including renal function blood tests, upper tract imaging and urodynamic studies, has been advocated [34]. Treatment options, analogous to neurogenic bladder patients, are tailored to the specific patient and includes behavioural modifications, nocturnal bladder emptying, double voiding, pelvic floor muscle therapy, anticholinergics, clean intermittent catheterisation, alpha antagonist, and in selected cases, bladder augmentation [34]. Chronic kidney disease develops in up to 32 % of PUV patients and about 20 % of these progress towards ESRD [35]. Renal transplantation in these patients can be performed safely and effectively [36,37]. Prior to transplantation, a full bladder and voiding assessment is recommended. Renal function should subsequently be monitored throughout life by both an adult urologist and a nephrologist.

Hypospadias

Hypospadias is usually diagnosed and treated in early childhood. Surgical correction, aimed at restoring both normal penile function and appearance, is typically performed in early childhood using a variety of surgical techniques. Long-term follow up after hypospadias repair is essential as significant rates of late complications have been reported [38,39]. A recent study showed a total reoperation rate of 48 % in the first 15 years of life in proximal hypospadias [40]. Penile development, especially during puberty, can result in new functional concerns. Additionally, some complications, including fertility, sexual dysfunction, voiding lower urinary tract symptoms and cosmetic dissatisfaction, may only become apparent as patients become sexually active [8,41]. In adult hypospadias patients, urethral stricture and lower urinary tract symptoms (45—72 % and 50—82 %, respectively) are the most commonly presenting conditions. This is followed by urethrocutaneous fistula (16—30 %), uncorrected hypospadias (14—43 %), spraying of the urinary stream (24 %), urinary tract infections (15—25 %), ventral curvature (14—24 %), balanitis xerotica obliterans (8—43 %), dysuria (10 %), and general genital dissatisfaction (7 %) [41]. Urethral carcinoma may present years following substitution urethroplasty. Urethral stricture recurrence may warrant further investigations [42—44]. It is recommended that adult patients are best addressed by a urethral reconstructive urologist, as a general urologist may have limited exposure to the complex urethral reconstructive procedures often required to manage these issues.

Bladder-Exstrophy-Epispadias Complex (BEEC)

The management of BEEC in infants is well established and outcomes in specialist centres are well-described [45]. On the contrary, adolescent and adult care is rarely formally centralised [6]. Children with BEEC may often require reconstruction of the lower urinary tract and are at risk of long-term complications, sometimes associated with the interposition of bowel segments into the bladder [45]. In addition to urinary function, sexual and reproductive function can be impaired for both sexes. In men, dorsal penile curvature, a reduced corporal volume and a widened pubic symphysis can result in a short functional penile length. In women, vaginal stenosis (31 %) and pelvic organ prolapse may be present. Pregnancy is possible but with an increased risk of preterm labour. These women should be considered scheduled for an elective caesarean section to avoid potential complications associated with spontaneous vaginal delivery [6—8,46]. Medical comorbidities, including müllerian anomalies, contribute to increased risk of obstetric and urologic complications during pregnancy [47,48].

Individuals with BEEC are at an increased risk of developing bladder cancer, with the majority being diagnosed at a younger age compared to the general population and typically presenting with non-urothelial types [45,49,50]. A systematic review indicated that 56 % of BEEC patients with bladder cancer are diagnosed between the ages of 45 and 67, while 37 % are diagnosed between 0 and 44 years of age. The male-to-female ratio among these patients is 2.7:1, and adenocarcinoma accounts for 68 % of the tumour types identified [49]. The overall prevalence of bladder cancer in those with spina bifida is estimated at 2—4 % [51]. In contradiction to this, a study from the Mayo Clinic found no statistically significant difference in the rates of bladder cancer in those with reconstructed lower tracts in terms of age, stage, mortality rate, or median survival. However, in those who progressed to renal transplantation and immunosuppression, there was a significantly higher incidence of

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bladder cancer [52]. Although screening for symptoms of bladder cancer in individuals with BEEC has been suggested, no standardised surveillance protocols have been established to date [45,49]. Because of the complexity involved in the management of the paediatric BEEC patient, a similar transitional approach and infrastructure is recommended for this cohort who transition to adult care [46].

In a joint study between Ghent and Indianapolis, 76 % of BEEC patients required multiple continence procedures, which ultimately led to acceptable long-term sexual and urinary outcomes. Good sexual outcomes seemed to be related to urinary and continence outcomes [53]. A similar collaboration between Antwerp and London demonstrated that the use of open-ended questionnaires led to a clear correlation between number of reconstructive surgeries and sexual satisfaction, with 30 % patients experiencing symptoms of depression. This highlights the importance of psychological support for this cohort [54].

Differences of sex development (DSD)

DSD encompasses a broad spectrum of diagnoses, of which the majority of individuals present with ambiguous genitalia at birth and are cared for by paediatric services throughout childhood. However, a proportion of children with DSD present in early adolescence and spend only a short time in paediatric care before transition to adult services. Presentations can include but are not limited to amenorrhoea, obstructed menstruation, and vaginal/meatal stenosis. During transition, a general move towards independence and self-responsibility is pertinent, but also a more specific focus on discussing the DSD diagnosis with the individuals themselves along with the details of any treatment history and potential further management as the individual mature [55,56]. Studies of children with congenital adrenal hyperplasia (CAH), have shown that providing the adolescent with knowledge regarding the pathophysiology of CAH, an understanding of their medication regimen, skills to self-mange stress-dose steroids during illness, knowledge of sexual function and fertility expectations, will empower them to take primary responsibility of their care and transition into adulthood [57]. It has also been shown that transition readiness is higher among CAH adolescents with good medication adherence rates [58]. In a multicenter European registry study, 15 % of the women suffered from insufficient cosmesis and functionality after surgery, and sex life was even described as poor in approximately 30 % [59]. Therefore, the decision about early genital surgery should be considered carefully. Transitional care for children with DSD requires continuity of an expert multidisciplinary team supporting the child and their families in an environment comprising specialists (endocrinology, surgery, urology, psychology/psychiatry, gynaecology, sexology, genetics, social work, and nursing) with experience from both paediatric and adult practice.

Conclusion

This summary reflects the major themes and issues involved in transitioning an adolescent with a congenital or acquired urogenital anomaly into adult care. Transition programs should be personalised to each patient's needs, supported by a multidisciplinary team, and structured to encourage patients' ownership of their health as they mature. The overall goal is to facilitate a smooth and effective transition, ensuring these individuals receive the continuity of care required to manage their complex condition(s).

Author contributions

MS, FOK: prepared the manuscript, tables and figures; All authors approved the submitted manuscript.

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Conflict of interest

All members of the Paediatric Urology Guidelines Panel have provided disclosure statements on all relationships that they have that might be perceived to be a potential source of a conflict of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jpurol.2025.10.002.

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