Outcomes:
1. Assess compliance with CIC
2. Assess who participates in CIC
3. Self care effects on continence
4. Self care effects on upper urinary tract

Clinical Questions:
PRE-SCHOOL (3-5 YEARS)

Compliance with CIC? Who participates?
Initially, CIC is performed by a parent or caregiver and school nurses. Eventually, the primary responsibility of CIC is transitioned to the child. Transition of responsibility varies widely as do attitudes and groups of patients who transition readily.

- 42 children and adolescents aged 7–19
- More than one-third of subjects found CIC to be an inconvenience in their daily life and expressed difficulty performing CIC while in a school.

- Interviewed 22 adolescent SB patients (median age of 17) who had performed CIC for more than 5 years
- Universally positive attitudes of the participants toward the use of CIC.
- Reaching adolescence, expressed a reluctance to inform peers of need to perform CIC

- Higher level of lesion was associated with lower rate of self catheterization (SC).
- Mean age at SC via Mitrofanoff 9.45 years (SD 2.6), via urethra 9.7 years (SD 3.4).
- Female gender associated with lower rate of SC
- Hispanics lower use of Mitrofanoff.

Fortuna, SM. Pediatric IC: Education for community based collaboration. Spina Bifida World Congress 2017
- Collaboration among community providers. Urologic nurse can be liaison to ensure adequate education among caregivers.
Dangle, P et al. Factors associated with transition form caregiver to self clean intermittent catheterization in spina bifida. Spina Bifida World Congress 2017
-71.9% transition to SC by age 10. Reviewed patients ≥10.
-287 patients (175 (61%) SC)
-Delay or lack transition (UNIVARIATE)
  Female gender
  Myelomeningocele (vs. lipoma, meningocele)
  Medicaid
  Wheelchair
  Thoracic level
  Antimuscarinic use
  VP shunt
-Delay or lack transition (MULTIVARIATE)
  Thoracic (p=0.037, OR 0.435)
  Medicaid (p=0.001, OR 0.241)

Atchley, T et al. Age of transition to self clean intermittent catheterization in patients with spina bifida. Spina Bifida World Congress 2017
-696 patients - 378 (54.3%) CIC
  206 (54.5%) SC age known for 112/206
  64 focus of study
  46/46 (71.9%) by age 10
  56/64 (87.5%) by age 14
  9 years most frequent

TEEN AGE (12-18 YEARS)

How is continence affected by shift in responsibility to self-care?
How is maintaining a normal upper tract affected by shift in responsibility to self-care?

Searched for literature with search phrases and various combinations. No research has directly evaluated the shift to self-care and its effects continence or upper urinary tract health.

- Writes of the distinct clinical impression that bladders deteriorate at adolescents and attributes this in part to rebellion to CIC based on personal communication with McGuire


- Incidence of renal damage almost doubles in postpubertal patients treated conservatively through puberty
- Unclear whether this increased risk of renal damage is related to the deterioration of bladder function with increased outlet resistance stemming from a pubertal enlargement of the prostate gland in boys and estrogenization of the urethra in girls, or whether it represents a rebellion of teenagers against the discipline of CIC


- Anticholinergics and CIC were the standard lines of treatment
- Although a fourth of patients in this series discontinued anticholinergics, most patients continued CIC. This finding could be explained at least partly by the natural significant increase in bladder capacity noted as the patients progressed through puberty. The fact that the number of patients following a regimen of CIC increased after puberty makes it unlikely that the discontinuation of anticholinergic medications was due to poor patient compliance.


- No other studies that have made the direct correlation between self-management and UTI in myelomeningocele. Higher number of UTIs were associated with no history of shunting, lower educational levels, higher employment levels and lower AMIS scores (adjusted R2 = 0.774, P = 0.002).
- Conclusions Initiatives aimed at improving self-management skills or providing support for skin and bladder care may be warranted for those with high levels of motor impairment or lower educational levels.

**Research Gaps:**

1. Is transition to self care an independent risk factor for renal injury
2. Is transition to self care an independent risk factor for incontinence