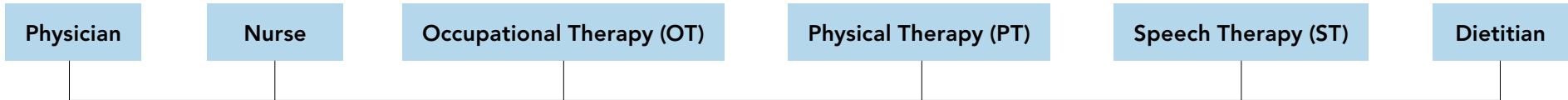
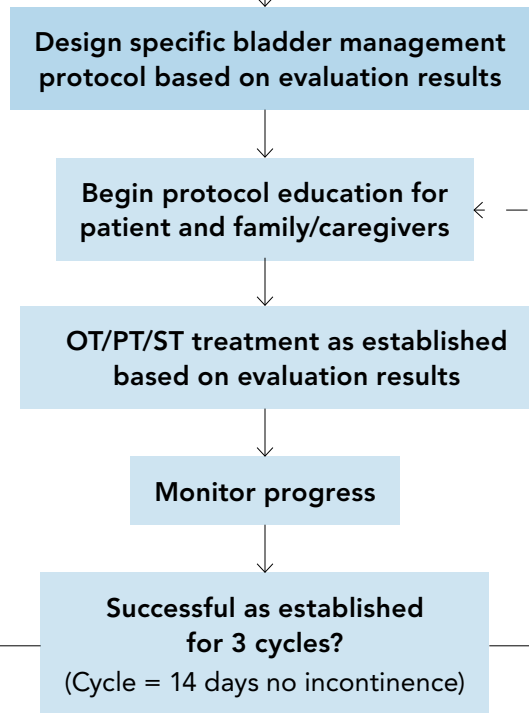


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EVALUATIONS

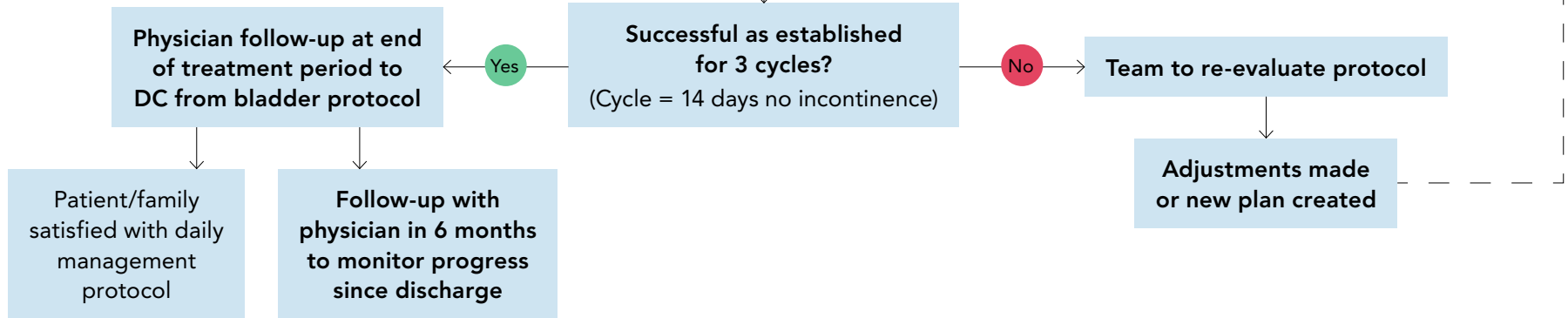


General assumptions	
New injury	Protocol initiated within 24–48 hours of admission with physician order
History of neurogenic Dx	Protocol initiated when able to demonstrate skills of Rehab Indicators of Readiness (page 3)
Procedure occurring changing current routine	Protocol initiated to facilitate new plan of care



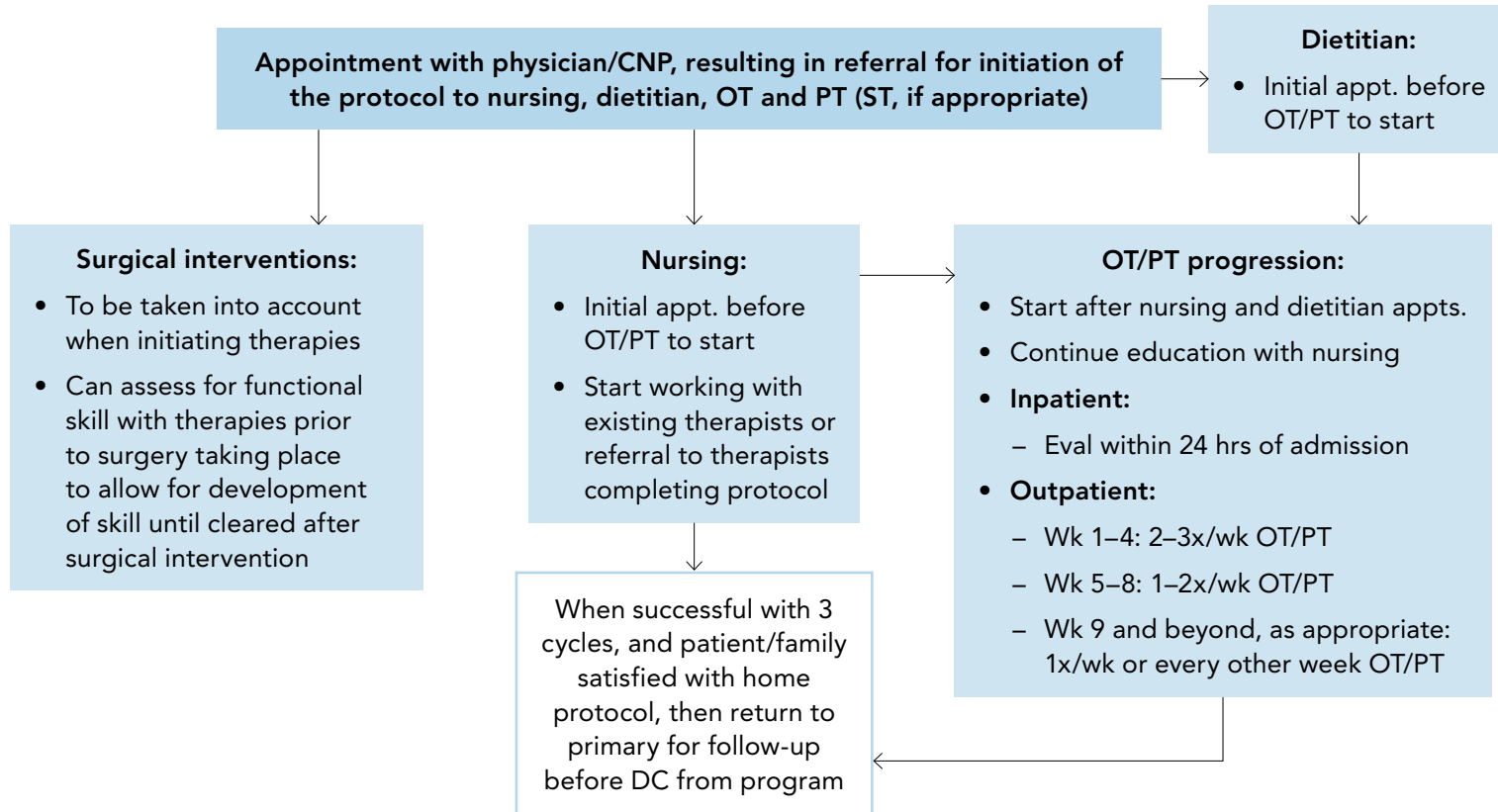
Level of involvement	Functional independence level
C1–C5	Total assist. Able to give verbal direction to caregivers based on cognitive abilities
C6	Some to total assist (potential for independence with leg bag emptying)
C7–C8	Independent to some assist
T1–S5	Independent

Source: Consortium for Spinal Cord Medicine, 1999



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INITIATION OF PROTOCOL



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REHAB INDICATORS OF READINESS

If child is new to therapies/rehab then these will be assessed as part of intake into protocol.

OT

- Dressing/undressing UE/LEs
- Fine motor function for managing equipment and clothing
- Hygiene skills for washing hands
- Sensory prepared for toileting
 - Sitting without diaper, noises of the bathroom, level of distress with being wet/soiled, tolerance of wearing underwear, etc.
- Extended periods of dryness during the day
- Awareness of need to void/have BM or distress/dislike of being wet or soiled
- Connecting elimination with or interest in toileting/hygiene
- Regular voiding/BM patterns already established

PT

- Ability to transfer on and off toilet/commode
- Sitting balance for 10 min.
- Standing balance for 10 min.
- Dynamic weight shift while in seated position for 20' outside of base of support in all planes

ST

- Understand and respond to directions, questions, or words related to toileting routines
- Communicates need to go/having went/outward signs of needing to go (verbally or nonverbally)
- Cause and effect
- Follows modeling

Kaerts, et al. 2012

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TYPICAL DEVELOPMENTAL STAGES

Skill	Task	Age (in years) 90% has mastered skill
Toileting	Indicates when wet/soiled	2.0–2.5
	Manages toilet, clothing management	3.0–3.5
	Takes self to bathroom, distinguishes need to void vs. eliminate	3.0–3.5
	No bowel accidents	3.5–4.0
	Dry day and night	4.5–5.0
	Thoroughly wipes	6.0–6.5
Dressing	Don/doff elastic waist pants	3.0–3.5
	Don/doff pull on shirt	3.5–4.0
	Removes and unfastens all clothing	4.5–5.0
	Dons and fastens all clothing	5.5–6.0

Skill	Task	Age (in years) 90% has mastered skill
Grooming	Washes/dries hands thoroughly	4.0–4.5
Transfers	Unsupported sitting: toilet	2.0–2.5
	On/off low potty	3.0–3.5
	On/off toilet: arms	3.0–3.5
	On/off toilet: no arms	6.0–6.5
Locomotion	Moves between rooms with no difficulty	1.0–1.5
	Opens/closes doors	3.0–3.5
	Walks up/down full flight of stairs without difficulty	3.0–3.5

Haley, Coster, Ludlow, Haltiwanger and Andrellos, 1992

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TYPICAL DEVELOPMENTAL STAGES
with Myelodysplasia (80th percentile)

Skill	Task	L2 and above	L3, L2-L4	L4-L5	S1 and below
Grooming	Washes hands — no help	9 yrs	6.5 yrs	6.75 yrs	5.25 yrs
Dressing	Removes pants	10 yrs	8 yrs	6.33 yrs	5.5 yrs
	Dons pants	12.5 yrs	11.33 yrs	7 yrs	5.75 yrs
	Pull on garment	10 yrs	8 yrs	6 yrs	6 yrs
	Shirt with buttons	11.25 yrs	6.5 yrs	7 yrs	6 yrs
	Removes braces	9.25 yrs	9.25 yrs	7 yrs	8.5 yrs
	Full dressing self (except difficult snaps)	10 yrs	10 yrs	9 yrs	7 yrs
Personal awareness	Asks about routine bodily functions	7 yrs	5.66 yrs	4.83 yrs	4.5 yrs

Sousa, Telzrow, Holm, McCartin and Shurtleff, 1983

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MEDICAL MANAGEMENT

BLADDER MANAGEMENT OPTIONS

- Scheduled voiding
- Self-catheterization: intermittent; indwelling (Mitrofinoff)
- Vesicostomy
- Reflex voiding
- Pharmacological: Botulinum Toxin injection; Alpha-Blockers
- Crede and Valsalva
- Endourethral stents
- Transurethral sphincterotomy
- Electrical stimulation and posterior sacral rhizotomy
- Bladder augmentation
- Continent urinary diversion
- Cutaneous Ileovesicostomy

(Consortium for Spinal Cord Medicine, 2006)

Physicians:

- Create written Plan of Care (POC) for team to follow.
- Start interventions based on POC
 - Catheterization
 - Medications/supplement
 - Orders for rehab, dietitian or any additional services
 - Equipment/supplies orders as necessary
 - Sensation testing

(Newman, 2012)

Nursing:

- Bowel and bladder assessment (current and history)
- Start daily diary of bladder for what currently doing and effect of interventions — at least 72 hrs
- Begin toileting program and education
 - Intervals of every 2–3 hrs
 - Upon waking, after breakfast, after lunch, after dinner and before bed;
Can also do at night if necessary
- Patient and family/caregiver education and assisting with interventions
- Skin management if incontinent
- See Appendix A for phase orders for bladder maintenance

(Newman, 2012)

Dietitian:

- I. Assessment of:
 - Hydration status: fluid intake vs. urine output, urine color chart
- II. Management
 - Calculation of maintenance fluid needs + **500mL**
 - Holliday-Segar method = 4, 2, 1 rule
 - Body Surface Area (BSA) = $m^2 \times 1600 \text{ mL} + 500\text{mL}$
- II. Cont. of management
 - Consideration of bladder irritants that cause incontinence:
 - Caffeine, carbonation, chocolate, citrus
- III. Education of parents/caregivers
 - Oral intake
 - Enteral tube flushes

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REHABILITATIVE MANAGEMENT

Bowel and Bladder Rehab Specialist (Occupational Therapist and/or Physical Therapist):

- ADL skills – I or mod. I with don/doff clothing; hygiene
- Sitting balance for 10 min.
- Standing balance for 10 min.
- Dynamic weight shift while in seated position for 20' outside of base of support in all planes
- Spine mobility while seated
- Task analysis for specific management program:
 - Bathroom analysis
 - Toileting devices/adaptations to task necessary
 - Advanced equipment needs related to toileting
 - General toileting skill analysis
 - Ability to assemble supplies
 - Cleaning up of supplies
 - Hand hygiene
- Education of anatomy and bowel/bladder function, with nursing
- Schedule for voiding/elimination
- Hydration/bladder irritant education
- Constipation management with primary care
- Scars/soft tissue mobilization
- Core strength
- Rib mobility/diaphragmatic breath pattern training
- Communication with client and caregivers for needs

Occupational Therapy (OT):

- Assess hand function — grip/pinch testing; finger ROM/Opposition; Grasp patterns; In-hand manipulation; Stereognosis; Proprioception of UEs; Visual Perceptual skills (as needed)
- Advanced interception needs

Physical Therapy (PT):

- Gait
- Mobility
- Advanced hip/spine/pelvis

Speech Therapy (ST):

- Current cognitive status
- Executive function
- Understand and respond to directions, questions or words related to toileting routines
- Communicates urge needs (verbally or nonverbally)
- Cause and effect

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TYPES OF ADAPTIVE EQUIPMENT

- Folding frame or fixed frame
- Self-propulsion or attendant propulsion
- Tilt-in-space commode
- Custom-made pressure-reducing foam seat with vinyl cover
- Smaller or extended aperture
- Padded/custom backrest/seatrest
- Toilet ring
- Arm rests
- Headrest
- Handles
- Leg rests
- Anti-tip bars
- Easy wipe
- Toilet aid/self wipe
- Bottom Buddy™
- Adaptive clothing
- Transfer board
- Mechanical lift
- Reacher
- Mirrors
- Reducer ring

EQUIPMENT BASED ON LEVEL OF INJURY

C1–C4	<ul style="list-style-type: none"> • Mobile shower commode with custom padded seat • arm supports, head rest/support • lateral supports • tilt-in-space
C5–C6	<ul style="list-style-type: none"> • Mobile shower commode with custom padded seat • Potential need for seat-to-back resting angle or arm rests
C7–C8	<ul style="list-style-type: none"> • Mobile shower commode with custom padded seat • Full or partial side cutouts for access • Adaptive equipment (i.e., suppository inserter)

T1–L1	<ul style="list-style-type: none"> • Mobile shower commode with custom padded seat with full or partial side cutouts for access • Padded toilet seat • Over-toilet aid with padded seat
L1–S5	<ul style="list-style-type: none"> • Mobile shower commode with custom padded seat with full or partial side cutouts for access • Over-toilet aid with custom padded seat

ACI State Spinal Cord Injury Service, 2014; Galant and Victor, 2016

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APPENDIX A
Phase Orders for Bladder Maintenance

PHASE 1: PICKING YOUR CATHETER

- Clean or sterile cath Q _____ hours during the day/night with a _____ Fr. catheter
- Bladder irrigation Q _____ hours with _____
 - French size: _____
 - Material(s):
 - » Pre-lubricated
 - » Silicone/latex-free
 - » Lubricating jelly
 - » Gloves
 - » Chucks
 - » Urine containment system (urinal)
 - » Other: _____

PHASE 2: DEVELOPMENTAL ABILITIES (see page 4)

- Education of: Parent/caregiver/child

PHASE 3: DEVELOPING A MAINTENANCE SCHEDULE

- Clean or sterile cath Q _____ hours during the day/ night with a _____ Fr. catheter
- Bladder irrigation Q _____ hours with _____

Age	Weight (kg)	Foley (Fr)
0–6 mo	3.5–7	6
1 year	10	6–8
2 years	12	8
3 years	14	8–10
5 years	18	10
6 years	21	12
8 years	27	12
12 years	Varies	12–14

Handouts:

- Parents:
 - Male: childrensMN.org/educationmaterials/childrensmn/article/15537/catheterizing-a-boy-intermittent
 - Female: childrensMN.org/educationmaterials/childrensmn/article/15538/catheterizing-a-girl-intermittent
- Nursing/professionals – Lippincott procedures:
 - Self-catheterization, pediatric female: procedures.lww.com/lnp/view.do?pld=2782881
 - Self-catheterization, pediatric male: procedures.lww.com/lnp/view.do?pld=2782880

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