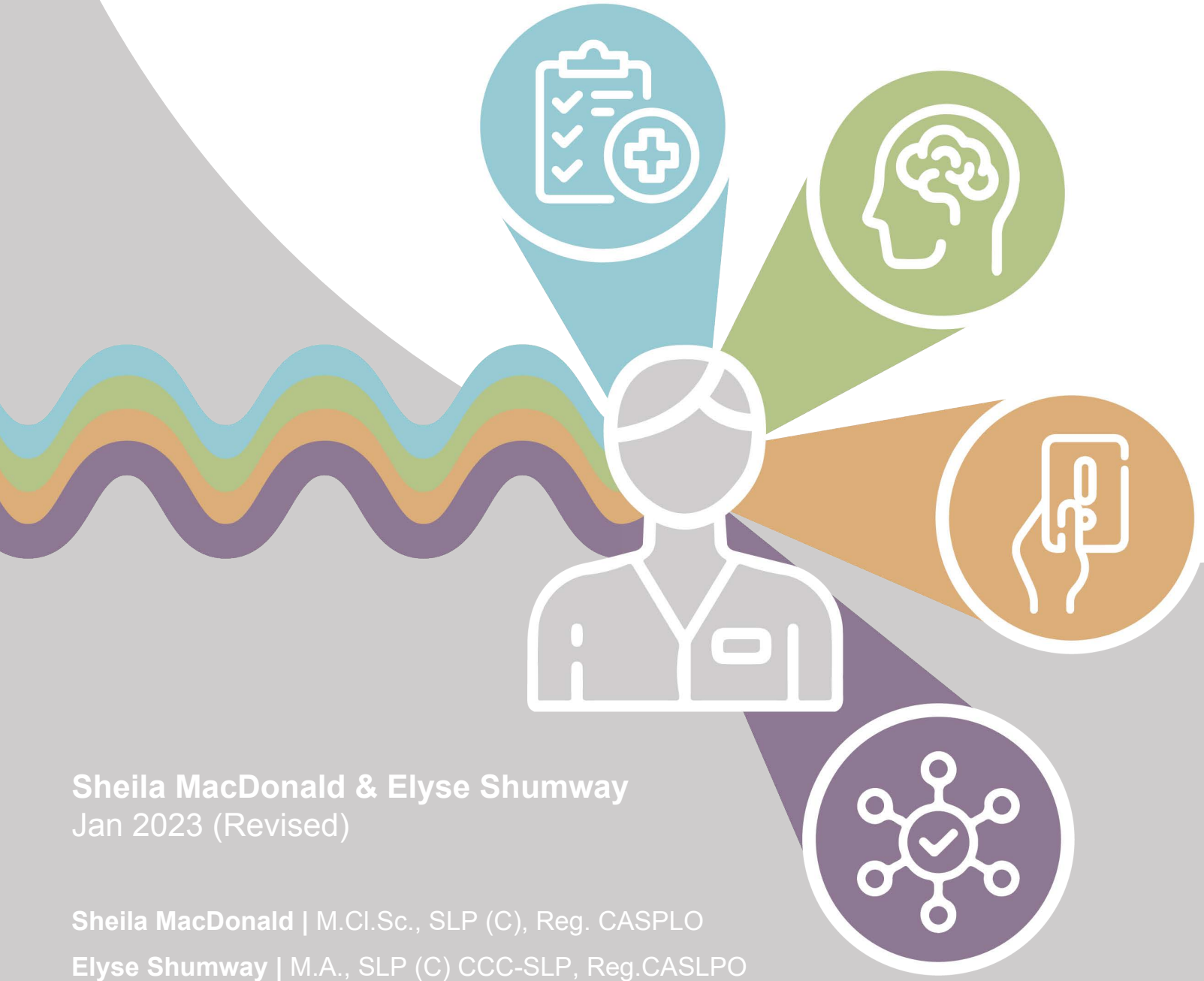
Cognitive-Communication Evidence Application for Speech-Language Pathologists/Therapists:

Map of Clinical Recommendations for Adults with Acquired Brain Injuries (CCEAS MAP: ADULT ABI)



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Jan 2023 (Revised)

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Cognitive-Communication Evidence Application for Speech-Language Therapy

The CCEAS-MAP

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Focus of these Clinical Recommendations:
These evidence-based clinical recommendations address interventions for cognitive-communication disorders (CCD) in adults with acquired brain injuries (ABI) along the full continuum of care from injury to return to work, school, and social participation. This evidence map pertains to speech-language pathology (SLP) or speech-language therapy (SLT) practice for adults with CCD.

Search & Extraction Process:
These Clinical Recommendations were extracted from **129** published guidelines, systematic reviews, meta-analyses, clinical reviews, and surveys based on a search and extraction process described in MacDonald & Shumway (2022). Included were publications and guidelines from the period of 2011 to 2021 that synthesize and evaluate multiple studies and integrate 3 kinds of evidence.

1. ***Research Evidence:*** From systematic reviews and meta-analyses from the SLP CCD literature and multidisciplinary literature relevant to CCD.
2. ***Clinician or Clinical Practice Evidence:*** From guidelines, surveys, review articles and consultations.
3. ***Persons with Lived Experience Evidence (PWLE):*** Perspectives of individuals with brain injuries and their close others found in surveys, review articles and consultations.

This current version 1.2 incorporates the recommendtions from the INCOG Guidelines 2023.The recommendations are summarized, categorized according to areas of SLP practice. Recommendations are stated in actionable language to assist SLPs in interpretation, application, and self-evaluation.

This knowledge translation tool is intended to guide SLPs to the rich body of literature informing SLP practice for adults with ABI related CCD. Whereas guidelines and systematic reviews appraise the evidence to develop practice statements, this document guides clinicians to that evidence to build upon their practice knowledge.

Intended Use:
This is a knowledge translation tool or map of evidence-based clinical recommendations and is designed primarily for SLPs who serve adults with acquired brain injuries along the care pathway from coma (disorders of consciousness) to career (vocational rehabilitation). It summarizes available guidelines, practice statements, and clinically relevant research into an accessible format for the following purposes:

- Synthesize the clinical recommendations available in published peer reviewed journals and guide-lines (international, national, local).
- Incorporate clinical practice knowledge from SLTs/SLPs and persons with lived experience of brain injury (PWLE).
- Educate readers about the amount and type of ev-idence available and direct readers to the speci ic guidelines & synthesis articles.
- Assist SLPs in planning evidence-based inter-ventions along the continuum of care, particularly those serving general or diverse caseloads
- Examine the continuum of care and the varied needs along the service continuum, and highlight the needs for lifelong supports.
- Identify areas with a strong evidence base while identifying gaps and areas for future research.
- Provide quick access to cognitive-communication intervention evidence when advocating for services, participating in guideline development, planning care pathways, educating funding sources, or pro-viding consultation regarding optimal intervention for adults with ABI.







Outline of Recommendations

1

Part 1: General Clinical Recommendations

2

Part 2: Treatment by Severity

3

Part 3: Interventions for Specific Cognitive-Communication Functions

4

Part 4: Interventions for Return to Activities and Life Participation

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Also available at www.brainandcommunication.ca

PART 1

General Clinical Recommendations

Part 1: General Clinical Recommendations

1.0	Referral & Access to SLP Services
1.1	**Referral:** I educate and advocate for individuals with communication deficits after ABI to be referred to SLT/SLP for evaluation and treatment of communication impairments, including cognitive-communication impairments.
1.2	**Access Advocacy:** I advocate for and educate others regarding when to refer to SLP for CCD, drawing on evidence-based resources such as the INCOG Guidelines, the ASHA Referral guidelines, the CASLPO Guidelines, the SAC Position Statement, or the CCCABI referral tool. I educate referral sources that cognitive-communication disorders can result from a variety of causes (e.g. stroke, traumatic brain injury, hypoxia, infections such as COVID 19 or encephalitis, etc.) and that, regardless of the etiology, SLP's can assist with assessment, education, and provision of strategies and supports to assist with life re-integration in community, work, social and academic pursuits.
1.3	**SLP Treatment Access:** I advocate for individuals with cognitive-communication deficits secondary to ABI to be offered treatment by my service/facility or ensure they are referred to an SLP at another service/facility or community organization.
1.4	**SLP ABI Knowledge & Competencies:** I ensure that I have the required competencies for acquired cognitive-communication disorders intervention and I seek professional development specific to the individual's injury severity (concussion/mild; severe; disorders of consciousness) and stage of intervention (i.e., acute, community, return to school etc.).

1.0 Evidence Sources: Referral & Access to SLP	Recommendations Supported
INCOG Guidelines Togher et al., 2023*	1.1, 1.2, 1.4
CASLPO Guidelines, 2015	1.1, 1.2, 1.3, 1.4
INESS Guidelines, 2014	1.1, 1.3
ASHA Referral Guidelines	1.1
Hardin et al., 2021	1.4
Knollman-Porter, et al, 2021	1.2
MacDonald, 2021	1.1, 1.2, 1.3
Morrow et al., 2020	1.4
Ramage, 2020	1.1, 1.2, 1.3
Ramsay & Blake, 2020	1.1, 1.2, 1.3
MacDonald, 2017	1.1, 1.2, 1.3, 1.4
Barman et al., 2016	1.1
Blake et al., 2013	1.1, 1.2
Institute of Medicine. 2011	1.3

*INCOG Guidelines 1.0 (Togher et al., 2014) were cited in the initial version of the CCEAS-Map. INCOG Guidelines 2.0 (Togher et al., 2023) were recently published, reviewed, and added.

2.0	**Overall Principles and Approaches to Intervention** *These principles apply to all sections*
2.1	**Person-Centred:** I engage the individual as a partner in their care using a person-centered approach that tailors intervention to the individual's unique needs, goals, preferences,and life circumstances. I consider individual and personal factors, health and injury history, cognitive-communication strengths and weaknesses, and influences on functioning (physical, emotional, linguistic, contextual).
2.2	**Communication Competence:** I employ a communication competence approach which has a central goal of increasing the individual's independence, participation, and competence in daily life communications in family, community, and social interactions, required for competent performance in home, work, school, or other life settings. I follow the tenets of the World Health Organization's model. That is, I address not only the person's impairments in specific skills, but also their success in performing communication activities to achieve full participation in their desired life roles (e.g., parent, learner, community volunteer, worker, etc.).
2.3	**Family & Close Others:** Counseling & Supports: I partner with family, communication partners, carers, and close others by providing education, support, counseling, and involvement in assessment, goal setting, treatment, monitoring, and discharge planning. I collaborate with close others and provide them with options to tailor to their needs (e.g., family education, peer support, brain injury support groups, communication partner training, counseling). My focus in this collaboration is on cognitive-communication functioning for life. I refer to and collaborate with other team members regarding additional emotional, psychological, or counseling supports.
2.4	**Family & Close Others: Education & Training:** I provide education & training to address communication challenges in hospital, home, community, and social settings, always supported with written materials, and tailored to their needs (e.g., translation, communication partner training, graphic formats).
2.5	**Family & Carers Cognitive-Communication Long Term:** I understand that cognitive-communication difficulties can be highly burdensome for family members and that communication support needs change over time. I provide families with cognitive- communication supports and refer to, or advocate for, long term supports beyond the hospital phase.
2.6	**Context:** I know that the individuals' competence will vary depending on the contexts in which they are communicating. I consider a range of contextual factors in assessment and treatment planning (e.g. types of communications, relationships, roles, cognitive complexity, environment). I provide contextual intervention through a variety of methods to address personal life goals (e.g., practice in groups or real-life activities, recording and review, virtual options, monitoring and evaluation in daily life contexts, communication partner training, and strategy application in "real world" or naturalistic situations). I recognize that although decontextualized treatments may be appropriate in some contexts, based on multiple studies, the contex-tualized approach is most effective due to challenges with generalization to life activities.
2.7	**Team:** I participate as a member of a coordinated interdisciplinary team. This includes collaborating with team members in devising and implementing management plans, referring to appropriate services, engaging in proactive communications (team meetings, sharing reports, etc.) and assisting the individual and family in learning about care options. It also includes regular education about SLP's role in returning individuals to everyday activities and life participation through cognitive-communication intervention.
2.8	**Meaningful:** I collaborate with the individual and close others to develop goals, strategies, feedback, and practice activities that are meaningful to them.

2.9	**Intervention Options:** I assist the individual and family in understanding and tailoring a range of evidence-based options to their needs (e.g., telepractice, specialty clinics, residential services, peer support, community brain injury associations, etc.)
2.10	**Model Driven:** My interventions are informed by conceptual frameworks or models that are evidence based (e.g., Model of Cognitive-Communication Competence (MacDonald, 2017), Ylvisaker & Feeney Coaching Model, RTSS Framework (Turkstra et al., 2016) , World Health Organization Framework WHO-ICF framework (International Classification of Functioning, Disability and Health; WHO, 2001)

2.0 Evidence Sources: Overall Principles & Approaches	**Recommendations Supported**
INCOG Guidelines 2.0, Togher et al., 2023*	2.1, 2.2, 2.3, 2.4, 2.6, 2.7
CASLPO Guidelines, 2015	2.1, 2.2, 2.3, 2.4, 2.6, 2.7
Cicerone et al., 2019 Cognitive Guidelines	2.3, 2.4
INESS Guidelines, 2014	2.1, 2.7
Behn et al., 2021	2.4
Hardin et al., 2021	2.1, 2.10
Wiseman-Hakes et al., 2021	2.4
Grayson et al., 2020	2.3, 2.4, 2.5
MacDonald, 2017	2.1, 2.2, 2.3, 2.4, 2.6, 2.10
Short, 2014	2.4
Cappa et al., 2011 European Guidelines	2.5

*INCOG Guidelines 1.0 (Togher et al., 2014) were cited in the initial version of the CCEAS-Map. INCOG Guidelines 2.0 (Togher et al., 2023) were recently published, reviewed, and added.

3.0	Assessment
3.1	**SLP Assessment Knowledge:** I have the knowledge, skills, and judgment to select, develop, administer, and interpret cognitive-communication screening and assessment measures appropriate to the ABI pop-ulation characteristics and stage of recovery (see list of SLP CCD Assessment competencies in CASL-PO, 2015). I recognize that screening tools are insufficient to detect CCD and a full evaluation is usually warranted.
3.2	**Timing:** I begin SLP Cognitive-Communication Assessment as soon as the individual's condition allows including those with disorders of consciousness, post traumatic amnesia, or agitation.
3.3	**Comprehensive:** My SLP assessments are comprehensive and based on a model or framework that includes evaluation of all aspects of *communication* (i.e. auditory comprehension, verbal expression & discourse, reading comprehension, written expression, social communication), *cognitive functions* (attention, memory, organization, reasoning, problem solving, learning, social cognition), *physical in luences on communication* (e.g., hearing or auditory functioning, visual functioning, motor speech, fatigue, sleep, etc.), *emotional influences on communication* (e.g., post traumatic stress disorder) and *control factors* (awareness, self-regulation, metacognitive skills, executive functions).
3.4	**Individualized:** I develop an individualized cognitive-communication assessment plan that includes consideration of individual & personal factors (e.g., age, education, language, culture, pre-injury communication style), health & injury related factors (time & cause of injury, severity, time post injury), cognitive-communication severity, stage of recovery and primary concerns, influences on communication, and communication contexts and goals.
3.5	**Collaborative Goal Setting:** I collaborate with the individual, family or close others, and other carers in the assessment and development of care plans or cognitive-communication goals.
3.6	**Co-Occurring or Co-Morbid factors:** I take a full case history and consider co-occurring or comorbid conditions such as depression, anxiety, pain, fatigue, sleep, and other emotional factors regarding their potential impact on communication. While I do not assess these directly or make a diagnosis, I refer and collaborate appropriately.
3.7	**Assessment Measure Selection:** When selecting cognitive-communication assessment measures I consider the following guiding questions: Does the test have sufficient sensitivity & scope to identify cognitive-communication impairments? Does it characterize the components contributing to communication performance? Are the results appropriate for the real-life situations to which the person hopes to return? Does it assist with decisions about cognitive-communication intervention?
3.8	**Assessment Measures: Standardized:** I select the best available standardized measures both in terms of their psychometric properties (reliability, validity) and their sensitivity and specificity to cognitive-communication impairments. I am mindful that tests sample behaviours in limited contexts and conditions and I incorporate a variety of assessment measures (e.g., contextual, interview, self & other report). I seek to minimize practice effects and maintain test integrity (i.e. not over-testing, not sharing test materials in the public domain). I attempt to address barriers to the use of standardized tests (lack of time, lack of access to standardized assessment tools) and recommend full SLP evaluation in future if indicated.

3.9	**Assessment Measures: Contextual (Activity & Participation; Individual & Close Other).** Given the limitations of impairment level standardized tests in detecting subtle cognitive-communication deficits I also incorporate a range of other measures that evaluate contextualized communication. These may include individual and close other interview, activity level standardized tests, patient reported outcome measures (PROMS), real world observation, symptom checklists, communication partner evaluations or evaluations of cognitive-communication demands in the person's life environments.
3.10	**Assessment Measures: Communication:** I prioritize evaluation and recommendations regarding **communication** recognizing that SLPs have a unique expertise and training in communication and that communication is critical to life participation and well being. I may assess cognitive, emotional, or physical underpinnings to communication but ultimately, I seek measures that can evaluate and plan for the individual's communication functioning in the real world. In acute care settings, when other medical management goals need to be addressed, I also attempt to prioritize cognitive-communication goals.
3.11	**Collaborative Contextualized Hypothesis Testing:** I collaborate with other professionals and supports using an integrative approach whereby we generate hypotheses and test them to identify behaviours, triggers or setting events, impacts on functioning, and potential strategies and supports to decrease behaviours of concern.
3.12	**Communication Partners:** I examine the supports and structures that communication partners can provide currently and consider their readiness and ability to provide additional support to assist the person with ABI. Communication partners who can provide support include everyday communication partners (family & close others); paid carers; health professionals, and community members. I recognize the complexities of social interaction and consider the multi-modal factors and impacts of multiple communication partners on functional activities.
3.13	**Environmental Demands:** I consider the demands of the person's situations, contexts, and environments where they communicate.
3.14	**Assessment Interpretation or Formulation:** I interpret cognitive-communication assessment results and provide recommendations that take into account not only impairments and stage of recovery but also activity limitations, participation restrictions, and environmental barriers in accordance with the individual and family's goals and preferences.
3.15	**Communication of Assessment Findings:** I convey the results of cognitive-communication assessments and progress evaluations in verbal and written formats to the individual, close others, multidisciplinary professionals, and other support systems (e.g. schools, university accessible learning departments, vocational programs, funding sources, etc.). I provide this information in a manner that is clear, comprehensive, consented, tailored to the needs of the end user, and relevant to the individual's activities and life goals.
3.16	**Tele-Practice:** I consider tele-practice options for assessment to increase accessibility.

3.0 Evidence Sources: Assessment	Recommendations Supported
INCOG Guidelines Togher et al., 2023*	3.3, 3.9, 3.10, 3.11, 3.13, 3.13
CASLPO Guidelines, 2015	3.1, 3.2, 3.3, 3.6, 3.8, 3.9, 3.10; 3.13, 3.14, 3.15
Cicerone et al., 2014 Cognitive Guidelines	3.3
INESS Guidelines, 2014	3.2, 3.3
Hardin et al., 2021	3.3, 3.4, 3.6, 3.8, 3.9
MacDonald, 2021	3.1, 3.3, 3.4, 3.10
Roitsch, 2021	3.8
Steel et al., 2021	3.3, 3.4, 3.6, 3.7, 3.9
Behn et al., 2020	3.12
Morrow,et al 2020 tbi acute	3.10
Wiseman-Hakes et al., 2020	3.12
Morrow et al., 2020	3.1
Ramsay & Blake, 2020	3.10
MacDonald, 2017	3.3, 3.6, 3.13
Frith et al., 2014	3.1, 3.3, 3.7
MacDonald, 2017	3.3, 3.6
Wiart et al., 2016	3.2
Barman et al., 2016	3.10
Coleman & Frymark, 2015	3.16
Blake et al., 2013	3.3
Duff et al, 2012	3.12

*INCOG Guidelines 1.0 (Togher et al., 2014) were cited in the initial version of the CCEAS-Map. INCOG Guidelines 2.0 (Togher et al., 2023) were recently published, reviewed, and added.

4.0	Treatment - General Treatment Principles, Approaches, Strategies and Supports
4.1	**SLP Treatment Access & Onset:** I ensure that individuals with cognitive-communication deficits secondary to ABI are offered SLP treatment by our service/facility or by another service or community organization. I begin SLP cognitive-communication treatment as soon as the person's condition allows.
4.2	**Person-Centred:** I provide person centred treatment for individuals with cognitive communication impairments that considers their personal factors and preferences and engages them as partners in their care.
4.3	**Individualized:** I individualize the therapy by targeting specific goals tailored to the individual including consideration of their pre-injury life demands, communication style or abilities, current cognitive-communication profile, influences on performance, available supports, individualized hierarchy of difficulty, current life goals, and real world cognitive-communication demands in those targeted roles. When incorporating impairment-focused expressive interventions (e.g.,SFA, VNest), I consider the complexity of the of the cueing features and include generalization processes.
4.4	**Cognitive-Communication:** I provide cognitive-communication rehabilitation, particularly to those in post acute stage of brain injury to improve verbal memory, executive function, and functional outcomes. I advance to higher level cognitive functions (e.g., problem solving, reasoning, new learning) where capacity permits).
4.5	**Context:** I provide contextual intervention through a variety of methods to address personal life goals (e.g., practice in groups or real life activities, recording and review, virtual options, monitoring and evaluation in daily life contexts, communication partner training, strategy application in "real world" or naturalistic situations). I recognize that although decontextualized treatments may be appropriate in some contexts, multiple studies support the contextualized approach as most effective in achieving gains in daily life.
4.6	**Dosage & Intensity:** I provide or advocate for more intensive cognitive-communication intervention (i.e., minimum of 3 hrs multidisciplinary inpatient intervention, >20 hours total cognitive training) which evidence supports over less intensive approaches.
4.7	**Community SLP:** I promote timely access to outpatient or community-based rehabilitation including out-patient SLP. I assist in referring them to a specialized program or refer directly to SLPs with ABI exper-tise in the community.
4.8	**Education:** I provide adults with ABI and their carers information adapted to their needs (i.e., age, cultural language, plain language, graphics) in both written and verbal formats. Information includes common consequences, strategies, & resources.
4.9	**Meaningful:** I provide cognitive-communication rehabilitation that focuses on activities that are meaningful for the individual, relevant to their environment, and/or adapted to their own life.
4.10	**Environmental Supports & Routines:** I provide the individual with environmental supports (e.g., whiteboards, signs, reminders, notebooks, technology) as required.
4.11	**Groups:** I provide opportunities for group interventions to allow them to share experiences, practice. strategies, or social interaction targets.
4.12	**Augmentative or Assistive Technology:** I use assistive technology (AT), augmentative and alternative communication, to assist with cognitive-communication function or environmental interaction as required.

4.13	**Telepractice:** I provide or refer the individual for flexible options for cognitive-communication intervention or specialist consultation to increase accessibility despite potential barriers of geography or travel. These include telepractice or virtual (phone, videoconferencing) as well as in-person intervention.
4.14	**Cognitive Rehab for all ABI:** I educate and advocate for and provide cognitive and communication rehab recognizing that it is evidence based for most forms of ABI: epilepsy, neoplasm, anoxia, encephalitis
4.15	**SLP Role in Cognitive Rehabilitation:** I educate and advocate for the role of SLP in cognition recognizing that SLP has played a key role in the development of effective cognitive interventions and related research.
4.16	**Technology:** I explore technology options with the individual based on their needs, abilities, preferences, the functional goal of the technology, available technology options, and the most efficient and effective methods. While multiple forms of technology exist (apps, computer programs, online supports, personal assistants, social media, virtual reality) I assess their utility on an individual basis. I provide clinician support, recognize the limitations of some apps (e.g., those without interactive features) and link them explicitly to treatment goals and methods.
4.17	**Online Connection:** I consider use of online communication systems (social media, video conferencing, etc.) to support those with TBI in social engagement and I tailor this to individual needs, abilities, and preferences.
4.18	**Long Term:** I recognize that for most individuals with moderate to severe ABI there will be long term consequences. I provide education, reporting, recommendations, and referrals that reflect the long-term impact of ABI, potential effect of aging and lifelong transitions, and related needs for long term monitoring, natural supports, cognitive exercise engagement, and later access to services.
4.19	**Treatment Outcomes:** Treatment progress, outcomes, discharge criteria, and ongoing monitoring should be determined by outcome measures that evaluate the person's cognitive-communication functioning in their desired real work environments (home, community, school, work, social settings). These include observations, patient reported outcome measures, and evaluations from communication partners who see them in context.

*INCOG Guidelines 1.0 (Togher et al., 2014) were cited in the initial version of the CCEAS-Map. INCOG Guidelines 2.0 (Togher et al., 2022) were recently published, reviewed, and added.

4.0 Evidence Sources: Treatment General	Recommendations Supported
INESS Guidelines	4.1, 4., 4.6, 4.7, 4.9, 4.10, 4.11, 4.12, 4.13, 4.14
INCOG Guidelines Togher et al., 2023	4.1, 4.2, 4.3, 4.5, 4.9, 4.1, 4.14, 4.20
CASLPO Guidelines, 2015	4.1, 4.2, 4.3, 4.4, 4.5, 4.7, 4.8, 4.9, 4.10, 4.11, 4.12, 4.15
Auslio, 2020	4.16
Brassel et al., 2021	4.5, 4.16
Brunner et al., 2021	4.5, 4.16, 4.17
O'Neill Pirozzi, 2021	4.17
O'Neill Pirozzi, 2021 cog exercise	4.18
Andelic et al., 2020	4.17 , 4.18
Grayson et al., 2020	4.2, 4.3, 4.4
Lindsay, 2020	4.3
Shorland et al., 2020	4.18
Vaezipour et al., 2020	4.16
Bogner et al., 2019	4.5
Maggio et al., 2019	4.16
Brunner et al., 2017	4.12, 4.13, 4.14, 4.16, 4.17
Konig et al., 2018	4.6
Barman et al., 2016	4.1, 4.4
Hallock & Collins, 2016	4.6
Patterson & Fleming, 2016	4.11
Wiart et al., 2016	4.3
Cooper et al., 2015	4.6
Leopold et al., 2015	4.12
Pietzak & Pullman, 2014	4.13
Short, 2014	4.8
Langenbahm et al., 2013	4.14
Scottish Guidelines, 2013	4.14
Van Heugten & Walters 2013	4.14
Cornis-Pop et al., 2012	4.2, 4.4, 4.10, 4.12, 4.16, 4.17, 4.19
Lu et al., 2012	4.6
Institute of Medicine, 2011	4.1

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PART 2

Treatment by Severity

Part 2: Treatment - By Severity

5.0	Moderate to Severe
5.0	**Moderate to Severe - This section includes:** • Disorders of Consciousness (DOC) – Minimally Conscious State - Rancho Los Amigo • Levels 2-3 Agitation & Confusion - Rancho Los Amigos Level 4 • Confused- Non-Agitated - Rancho Los Amigos Levels 5-6 • Post Traumatic Amnesia (PTA)
5.1	**Multidisciplinary for DOC:** I participate in a specialized multidisciplinary team to assess and treat those with DOC or, if one is not available where I work, I refer, or advocate for referral, for those with prolonged DOC (>28 days) to receive specialized multidisciplinary intervention assessment and intervention.
5.2	**Knowledge and Cautions:** I have reviewed information regarding disorders of consciousness, definitions, prognosis, complications, and team collaboration available in current guidelines (e.g., RCP Guidelines,2020, Giacino et al., 2018 or similar). I defer questions regarding diagnosis and prognosis to the attending physician. I have obtained training to use the recommended standardized assessment tools/ scales.
5.3	**Assessment for DOC:** In conjunction with the multidisciplinary team, I use the recommended assessment tools/scales, informal assessment, and observations to assess, periodically reassess, and document the arousal, attention, responsiveness & comprehension in patients with DOC. I also personalize stimuli when feasible. I provide ongoing assessment and monitoring and provide regular updates regarding cognitive and communication status based on these regular evaluations.
5.4	**Education & Counseling:** I provide education and counseling to families of those with disorders of consciousness and those with severe communication disability.
5.5	**Yes/No:** I provide direction in establishing yes/no communication systems as soon as possible through individualized assessment, direct intervention with the individual, training of communication partners, & environmental enrichment.
5.6	**Communication Support:** I provide individualized communication supports to assist others in evaluating and optimizing the person's comprehension & expression (training family & close others, health workers, support personnel, visual instructions)
5.7	**Sensory Stimulation & Regulation of Stimuli:** I provide sensory stimulation and train family, close others, and healthcare professionals to provide stimulation in a controlled, regulated manner with breaks to prevent overstimulation.
5.8	**Environment:** As a member of the multidisciplinary team, I assist with providing/practicing the use of environmental control and assistive devices (e.g., microswitches, environmental control devices) and evaluate the value of and readiness for augmentative/alternative communication.
5.9	**Regulation:** I provide support and training in how to regulate stimulation for optimal pacing, rest time, and prevention of fatigue or overstimulation (e.g., family and visitor education, reduction of stimuli or quiet time, stimulation then rest)

5.10	**Assessment Early Stages (Confusion, Awareness):** I have knowledge of disorders of awareness (anosognosia, denial), post traumatic amnesia, and confusion. I plan acute care assessments aware that individuals in acute care or early stages post injury may have communication challenges due to a combination of factors including linguistic impairment (e.g. aphasia, word finding problems) speech impairment (dysarthria, apraxia) and cognitive-communication impairments (inattentive, disorganized, verbose communication, behavioural regulation, self awareness).
5.11	**Education:** I provide education to the family, close others, support staff, and others regarding agitation, confusion, behavioural self-regulation difficulties, and neurobehavioural principles. I emphasize the role of cognitive and communication impairment in the confused state.
5.12	**Augmentative & Alternative:** I evaluate individuals with severe communication disorders and provide recommendations and training in the use of augmentative and alternative communication systems.
5.13	**Communication Partner Training:** I provide communication partner training (to close others & staff) to optimize compehension, expression, awareness, and orientation, and to minimize agitation, confusion & behavioural dysregulation.
5.14	**External Environmental Aids:** I use or recommend external/environmental aids to improve orientation and prospective memory, reduce confusion, and maintain calm.
5.15	**Self-Awareness:** I tailor interventions to the individual and provide engagement strategies, structure, a variety of types of feedback, and positive behavioural supports.
5.16	**SLP Assessment Acute Care:** I recognize that a person's cognitive-communication functioning is a critical factor in making discharge recommendations regarding their need for rehabilitation, ability to participate in rehabilitation, and their ability to return to community independence, work, or school. I therefore select assessment measures, both performance measures (i.e. tests) and contextual measures (interview, observation, discourse sampling) that are the most sensitive, specific, and standardized for this determination. I use standardized tools that allow for clear and efficient communication of findings with other team members, affected individuals and their families, dynamic assessment over time, and consistent documentation and communication with SLP colleagues at the next destination. I also recognize the limitations of structured testing in a clinical environment and always recommend monitoring of performance in real world communication tasks and referral to community-based SLP if indicated.
5.17	**SLP Acute Care Assessment Measures:** I select the most efficient, practical, and sensitive assessment measures for acute care including standardized tests, observation, structured interview, family and close other interview, , chart review, team consultation and clinical judgment. I recognize that assessment conditions, time, tolerance and assessment goals change across clinical settings and over time and I adjust the assessment protocol accordingly. When the assessment questions are complex, and time and conditions are limited, I ensure there is follow up, referral, or later stage assessment to address them.
5.18	**SLP Role in Acute Care:** I recognize that SLP assessment and education in acute care are critical to laying the groundwork for the individual and family's understanding of ABI, informed treatment decisions, and advocacy for the person as they move between settings. I also recognize multiple barriers to thorough assessment in acute care including time, prioritization of medical needs (e.g., swallowing, tracheostomy), busy environments, multiple tests and procedures, and short lengths of stay (6-17 days on average). Therefore I prioritize brief but optimally sensitive assessment and provision of family or close other education that is clear, easy, efficient and in writing for their review over time. Recognizing the time limitations, I also advo-cate for referral for full SLP assessment (inpatient or outpatient), multidisciplinary intervention, and follow up over time.

5.19	**SLP Acute Assessment:** I select assessment measures that have been proven to be most sensitive to cognitive-communication deficits in acute care and that are capable of differentiating typical from impaired performance post brain injury. These include standardized measures of verbal fluency (not semantic), comprehension, conversational discourse, and procedural discourse.
5.20	**Education of Referral Sources and Interdisciplinary Colleagues:** I recognize the importance of inter-disciplinary colleagues in referring individuals with brain injuries for cognitive-communication evaluation and I provide education or referral indicators to help them understand when to refer. I stress that SLPs have a key role to play in identifying communication impairments, educating and counseling families about communication, training communication partners, tracking communication progress, planning for discharge, and predicting functioning in the real world. I highlight the fact that cognitive-communication functioning in acute care has been shown to be predictive of functional outcome post discharge on gold standard outcome measures. SLPs have been shown to be effective in assessment, education, consultation, and intervention in early stages of disorders of consciousness, confusion, acute care, inpatient rehabilitation, and management of transitions to life communications. I stress that even individuals with mild ABI are susceptible to cognitive-communication impairment and should be referred to SLP or provided with opportunity for follow up.
5.21	**Early, Intensive, Multidisciplinary:** I advocate for early, intensive, multidisciplinary intervention which has been shown to be evidence-based.
5.22	**Confusion Supports:** I monitor communication of those in confused states or post traumatic amnesia (PTA). I educate others about optimal communication (i.e. short, simple, repetition). I provide natural memory supports, external memory aids, and family training which are evidence based. I recognize that systematic reality orientation is not supported.

5.0 Evidence Sources: Moderate to Severe	Recommendations Supported
DOC National Clinical Guidelines, RCP,2020	5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9
DOC Guidelines Giacino et al., 2018	5.1, 5.2, 5.3
INCOG Guidelines, Ponsford et al., 2023*	5.9, 5.12, 5.13, 5.20, 5.22
INESS Guidelines, 2014	5.4, 5.5, 5.6, 5.7, 5.10, 5.11
Behn et al., 2020	5.13
Wiseman-Hakes et al., 2019	5.13
Brett et al., 2015	5.15
Konig et al., 2018	5.21, 5.22
deTanti & Zampolini, 2015	5.7, 5.10, 5.11, 5.12, 5.13
Steel et al., 2015	5.11, 5.19, 5.20
Morrow et al., 2020	5.16, 5.17, 5.18, 5.20
Klingshim et al., 2015	5.7
Linghim et al., 2015	5.4, 5.6, 5.7
Schrijnemaekers et al., 2014	5.15
Scottish Guidelines, 2013	5.6

*INCOG Guidelines 1.0 (Ponsford et al., 2014) were cited in the initial version of the CCEAS-Map. INCOG Guidelines 2.0 (Ponsford et al., 2023) were recently published, reviewed, and added.

6.0	Mild / Concussion (“mild” or “mTBI”)
6.1	**Concussion Knowledge:** I understand that a concussion is a mild traumatic brain injury which, in at least 80% of cases, resolves after an initial period of rest (about 3 days) and results in a gradual return to functioning. However, approx. 20% of individuals will have prolonged or persisting symptoms (beyond 3 months) called post-concussion symptoms (PCS). These include a range of physical, cognitive, communicative, and emotional symptoms that are experienced by the individual on an ongoing basis, even when changes to the brain may be absent or temporary and not evident on scans or tests. The causes of PCS are complex and multifactorial. These symptoms can be subtle yet can significantly impact an individual’s functioning. I understand that there may be multiple causes for cognitive-communication difficulties in addition to brain injury (e.g., sleep difficulties, pain, anxiety, coping). I also understand that the complex interplay of initial sensitivities, symptoms, and reactions to activity limitations is explained in several models including the biopsychosocial model. Therefore, I assist the individual through the following main principles: 1. Validate Symptoms 2. Educate about multifactorial complexities and multiple influences on cognition 3. Consult and collaborate with interdisciplinary team members 4. Focus on functional reactivation over diagnostic deliberation, 5. Educate in a positive manner that avoids stressing “brain injury”, “disability” or inadvertently heightening concern (e.g., iatrogenic problems).
6.2	**SLP Referral and Role:** I ensure that those with PCS are referred or can self-refer to SLP services on a timely basis. I convey the role of the SLP is to address cognitive-communication difficulties that arise, regardless of cause, to provide positive education & personalized strategies, to provide dynamic coaching that promotes self-efficacy, and to collaborate with the individual and others in planning for gradual re-integration with tailored school and work accommodations.
6.3	**Interdisciplinary Team:** I recognize that the care of individuals with PCS can be complex and requires interdisciplinary collaboration by medical, mental health, and rehabilitation specialists. I also understand that “a core competency of interprofessional collaboration is understanding and valuing the knowledge and skills of each team member” (Mashima et al., 2021). I therefore work as part of an interdisciplinary team and promote collaborative, proactive communications.
6.4	**Interdisciplinary, Knowledgeable, Community Professionals:** I advocate for the individual with mTBI to have co-ordinated, interdisciplinary, outpatient or community-based rehabilitation. I have a list of people in the community who specialize in mTBI’s to whom I can refer those with mTBI/concussion.
6.5	**Family:** I collaborate with family members or close others of individuals with concussion or mTBI.
6.6	**SLP Assessment Timing:** I do not provide comprehensive cognitive testing in the first 30 days (strong evidence against). The onset for SLP intervention is generally recommended to be between 15 and 90 days post concussion.

6.7	**Comprehensive Cognitive-Communication Assessment:** My assessment is guided by a comprehensive model that includes assessment of all aspects of communication (auditory comprehension, reading comprehension, social communication verbal expression, written expression, and social interaction) as well as the cognitive influences on communication (concentration, working memory, prospective memory, new learning , episodic memory, executive functions, organization, planning, time management, reasoning, problem solving, metacognition, insight/awareness, information processing speed. The focus is on identifying changes in cognitive and communication functioning that affect daily communications, new learning, self-management, information management, social, academic or workplace success. See list of assessment measures in Hardin et al., 2021. This assessment provides the basis for determining the nature, severity, and characteristics of cognitive-communication disorder and is a prerequisite to designing and implementing an effective treatment program with baseline and pre-treatment measures, functional goals, and required supports.
6.8	**Co-occurring or Contributing Factors/Multifactorial:** I understand that mild brain injury symptomatology is usually multifactorial and may relate to multiple causes. I therefore use caution in attributing cause to brain injury and defer diagnosis of physical impairment (i.e. brain injury, pain) or psychological causes to the appropriate diagnosing professional. My role is to assess and diagnose cognitive-communication impairments that may result from multiple causes. I consider a range of factors that can influence communication and cognition including pre-injury factors, post injury factors, physical (e.g., pain, sleep, fatigue, vision, hearing) and emotional factors (e.g., post traumatic stress disorder, anxiety, adjustment, depression). I refer and collaborate according to individual needs. I explore symptom management as it relates to communication and cognition and collaborate with the individual, close others, and interdisciplinary service providers to identify factors that affect symptoms and develop plans for symptom management.
6.9	**Collaboration/Consultation:** I collaborate with other professionals including SLPs, behavioural / mental health therapists, specialty care physicians, audiologists, neuropsychologists, primary care physicians, physiotherapists, occupational therapists,optometrists or vision therapists.
6.10	**Individual Factors:** I consider or incorporate personal factors, personal expectations, beliefs, and attitudes.
6.11	**Environmental Factors:** I incorporate consideration of environmental factors.
6.12	**Assessment Approach:** I assess individuals with mTBI to identify individual goals, needs, and knowledge gaps. I use assessment results to develop and prioritize treatment goals. My assessment approach is person centered and collaborative.
6.13	**Cognitive-Communication Assessment:** I conduct a thorough cognitive-communication assessment using the best available measures that includes evaluation of the following: comprehension or language processing, attention, memory, word retrieval, verbal expression and discourse, reading comprehension, written expression, reasoning, executive functions, problem solving, and metacognition.
6.14	**Context:** I evaluate contextual factors that contribute to a person's functioning
6.15	**Assessment Measures:** My cognitive-communication evaluation is based on (1) thorough history; (2) clinical interview with the individual and family regarding their mTBI story, symptoms, chief complaint, personal and medical history reports of symptoms and the effect of symptoms on function; and (3) standardized performance measures that have been shown to be sensitive to cognitive-communication impairments and (4) contextual or "real world" evaluations that include observations, rating scales, discourse evaluations, questionnaires, and self-evaluations of daily communications.

6.16	**Assessment Interpretation:** Given the multifactorial nature of mTBI symptoms, I create an assessment formulation by integrating the findings of standardized tests, patient and family report, and the findings of other healthcare providers. I analyze assessment results to develop and prioritize treatment goals, determine activity modifications, appropriate treatment approach, environmental modifications, existing and future accommodations, need for strategies, current use of strategies, candidacy for individual treatment, and need for further referral.
6.17	**Reporting of Results:** I generate assessment reports that include qualitative and quantitative results, and recommendations. I review the results of the assessment with the individual in either face to face or written communications. I share my assessment results either formally or informally with family and other health care providers.
6.18	**Goal Setting and Treatment Planning:** I work collaboratively with the person to develop goals based on their needs, preferences, priorities, and evidence for various cognitive-communication treatment approaches.
6.19	**Treatment:** I provide treatment for prolonged cognitive-communication deficits (>30 days) that is person-centred, functional, flexible, and responsive. The focus is on functional re-activation, positive educa-tion, dynamic coaching, and strategy provision.
6.20	**Progress and Progression:** I involve the person in evaluating performance using outcome measures that reflect changes in daily functioning. I gradually reduce session frequency.
6.21	**Discharge and Follow Up:** Discharge is determined by the individual's preferences and the interdisciplinary team and may be related to arrangement of sufficient supports, goal achievement, the individual's ability to select/achieve goals independently or with support, or the individual having conflicting priorities. I provide the individual (and team) with a written discharge report. I provide the individual with the option for booster sessions as indicated by goals/preferences/changing life roles etc.
6.22	**Co-ordinated, Community-Based:** I provide and advocate for individuals with mTBI to have co-ordinated, interdisciplinary outpatient or community-based rehabilitation.
6.23	**SLP mTBI Quali ications:** I have appropriate mTBI/concussion experience or else I refer to SLPs who have that experience.
6.24	**Cognitive-Communication Assessment:** I conduct a thorough cognitive-communication assessment using the best available measures that includes evaluation of the following: comprehension or language processing, attention, memory, word retrieval, verbal expression and discourse, reading comprehension, written expression, reasoning, executive functions, problem solving, and metacognition.
6.25	**Audiology:** I ensure an individual with mTBI has been referred to audiologist for hearing difficulties or sensitivities (tinnitus).
6.26	**mTBI Expertise:** I refer the individual to professionals with expertise in concussion/mTBI.
6.27	**Comprehensive SLP Intervention:** I recognize that direct intervention has been shown to be effective after mTBI/concussion and that there is limited evidence to support providing psychoeducation alone. Therefore, I provide outpatient or community intervention that targets memory, attention, executive functioning, communication, social interaction, compensatory strategies, and environmental modifications.

6.28	**Cognitive-Communication Interventions:** I provide evidence-based interventions for cognitive-communication difficulties related to PCS including: positive education or psychoeducation, cognitive strategy instruction to address perceived deficits in attention, working memory, executive function, social communication. I use a personalized, dynamic approach to managing PCS that is tailored to the individual's symptoms and includes methods of individualized tracking of goal progress (e.g., goal attainment scaling) with a focus on functional change in daily cognitive-communication tasks.
6.29	**Comprehensive Interdisciplinary Intervention:** I refer or advocate for timely, evidence-based treatments and best practices from a clinic team or network of interdisciplinary healthcare providers with expertise in concussion management
6.30	**Prolonged Therapy:** I discourage prolonged therapy in the absence of improvement.
6.31	**Return to School:** I provide students with concussion with knowledge about concussion, validation of symptoms, recommendations for pacing and symptom management, and resources. I assist with proactive early access to academic accommodations, and offer support and monitoring through individual, group, or peer support options. I recognize that social connection is key for wellness after concussion and assist students in developing a plan for maintaining or enhancing social connection.
6.32	**Return to Work:** I recognize that, although most people return to work after a concussion or mild traumatic brain injury, those who do return often require supports and accommodations. In my assessment I consider cognitive-communication barriers to return to work and incorporate multidisciplinary team findings to formulate the relative influences of physical, cognitive, communication, and emotional difficulties on return to work. I then collaborate to develop a multidisciplinary plan for return to work that combines strategies tailored to cognitive-communication demands, adaptation of work environments, supports, education, and planning of gradual re-entry in phases, with regular team evaluations at each step.

6.0 Evidence Sources: Mild / Concussion	**Recommendations Supported**
Chesnutt, 2021	6.1, 6.2, 6.4, 6.6
Mashima et al., 2021	6.1, 6.12
Hardin et al., 2021	6.1, 6.2, 6.3, 6.4, 6.5, 6.22, 6.25
O'Brien et al., 2021	6.31
Meulenbroek et al., 2021	6.32
Wright & Sohlberg, 2021	6.26, 6.27, 6.28, 6.29, 6.30
Sohlberg & Mashima, 2020	6.31
Speech-Language and Audiology Canada, 2019 Position Statement SLP in Concussion	6.2, 6.3, 6.5, 6., 6.8, 6.9
ONF Guidelines 2017	6.6, 6.11, 6.31, 6.32
Dept of Defence Mild Guidelines, 2016	6.2, 6.3, 6.4, 6.5, 6.7, 6.8
International Centre for Allied Care, 2014	6.4, 6.7
Cornis-Pop et al., 2012	6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.15. 6.16

PART 3

Interventions for Individual Cognitive-Communication Functions

Part 3: Treatment by Specific Cognitive-Communication Domains

7.0	Attention and Concentration
7.1	**Assessment:** I assess attention, recognizing that it has been found to have a critical impact on communication behaviours such as discourse, tangential communication, social communication, auditory comprehension, verbal reasoning, topic maintenance, interpretation of social cues and emotions, verbal expression, reading comprehension, verbal response speed, and subvocal rehearsal.
7.2	**Attention Treatment Early Stage:** I do not provide attention training in the acute phase as it has been found to be ineffective in several systematic reviews.
7.3	**Attention Treatment Mid to Late Stage:** I provide attention interventions that are tailored to the individual's needs, preferences, and attention presentation; these evidence-based attention interventions include: direct attention training, metacognitive strategy instruction, modification of the environment, and other compensatory strategies.
7.4	**Attention Approaches Not recommended:** I recognize that computer-based attention tasks without clinician involvement are not recommended as they are not evidence-based. I recognize that while dual task training can be used to improve attention on tasks similar to those being trained, there is insufficient evidence of its effectiveness in improving daily functioning, particularly communication. I recognize that working memory training tasks have been shown to improve the person's performance on the task but not on daily activities such as communication. I recognize that training with periodic random auditory alerting tones is not recommended.
7.5	**Metacognitive Strategy Training:** I use metacognitive strategy training techniques using functional everyday activities which is highly recommended especially for individuals with mild-moderate attention deficits.

7.0 Evidence Sources: Attention	Recommendations Supported
INCOG-Ponsford et al., 2023*	7.2, 7.3, 7.4, 7.5
Cornis-Pop et al., 2021	7.1, 7.3
Van Solkema et al., 2019	7.1
Alashram & Anino, 2019	7.2
Cicerone et al., 2019	7.2, 7.3, 7.4, 7.5
Barman et al., 2016	7.3, 7.5

*INCOG Guidelines 1.0 (Ponsford et al., 2014) were cited in the initial version of the CCEAS-Map. INCOG Guidelines 2.0 (Ponsford et al., 2023) were recently published, reviewed, and added.

8.0	Memory and Working Memory
8.1	**Memory Rehabilitation:** I provide cognitive rehabilitation for memory deficits subsequent to TBI or stroke because it is evidence-based.
8.2	**Tailored Memory Goals:** I establish clearly defined memory goals that are tailored to and meaningful to the person (ecologically valid). In doing so I consider the following: severity of cognitive-communication impairment, cognitive-communication strengths and weaknesses, physical abilities, and premorbid use of electronic devices etc.
8.3	**External Strategies:** I train external memory strategies, especially for those with severe deficits, including both non-electronic (memory books, diaries, lists) and electronic (cell phones, timers, portable devices, apps, paging systems)
8.4	**Internal Strategies:** I provide education and training in the use of internal memory strategies (e.g., visualization/visual imagery, repeated practice, PQRST (Preview, Question, Read, Summarize, Test) for individuals with mild memory impairments.
8.5	**Error Control:** I use teaching or instructional strategies to constrain errors (e.g., errorless learning approaches, spaced retrieval, self-instructional techniques).
8.6	**Practice:** I incorporate sufficient time and opportunity to practice memory strategies across various stimuli and settings. I apply evidence-based instructional practices such as providing multiple exemplars, breaking tasks down, use of distributed practice, and error minimization (e.g. spaced retrieval).
8.7	**Working Memory:** I recognize the importance of working memory and provide rehabilitation focusing on improving working memory functions and strategies particularly as they relate to communication.
8.8	**Client-Focused:** I encourage self-generation of cues and self-cueing
8.9	**Strategy Use in Meaningful Daily Tasks:** I incorporate practice of individualized memory strategies into meaningful communication tasks in daily life. I recognize that memory restoration approaches (e.g. drill, or computer-based memory skills training) have not been shown to make gains in daily life.
8.10	**Prospective:** I provide prospective memory training which has been shown to be evidence based.
8.11	**Virtual Reality:** I consider virtual reality as a format particularly for improving memory, working memory
8.12	**Gesture:** I consider the role that gesture may play in facilitating memory and learning and I explore the individual's potential to benefit from gestures made by themselves or others.

8.0 Evidence Sources: Memory	Recommendations Supported
INCOG Velikonja et al., 2023*	8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, 8.10
O'Neill Pirozzi, 2016	8.8
Clough & Duff, 2020	8.12
Thomas et al., 2017	8.4
Davis et al., 2019	8.3, 8.4
Pietzak & Pullman, 2014	8.11
Ellott & Parente 2014	8.1, 8.2, 8.11
VandeVen et al., 2016	8.9
Hallock & Collins, 2016	8.4, 8.5
Barman et al., 2016	8.3, 8.5
INESS Guidelines, 2014	8.8
Cornis-Pop et al., 2012	8.2, 8.3, 8.4
Scottish Guidelines	8.4, 8.8
Shum et al., 2011	8.12
Cappa et al., 2011	8.3
Institute of Medicine 2011	8.4, 8.8

*INCOG Guidelines 1.0 (Velikonja et al., 2014) were cited in the initial version of the CCEAS-Map. INCOG Guidelines 2.0 (Velikonja et al., 2023) were recently published, reviewed, and added.

9.0	Executive Functions, Problem Solving, Reasoning & Metacognition
9.1	**Assessment of Executive Functions:** I am aware of the complexities of assessing executive functions and I seek the most sensitive and sound measures and corroborate with contextual information in the real world (i.e., individual and family report, observation, etc.)
9.2	**Strategies:** I select evidence-based strategies tailored to the individual's specific difficulties with executive functioning. (e.g. self-awareness, self-monitoring, planning, organization, reasoning, or problem solving). Strategies may include awareness training with video feedback, metacognitive strategy instruction (e.g. goal management training, plan-do-check), reasoning strategies, group interventions, telerehabilitation, or virtual reality. Key components include anticipation of future performance, self- monitoring, incorporating feedback, or reviewing past performance and adapting as indicated.
9.3	**Context:** I provide contextual training, so the individual understands the need for the strategy in context.
9.4	**Group:** I provide group based metacognitive interventions to assist with executive functions and problem solving.
9.5	**Reasoning & Problem Solving:** I provide strategies to improve the capacity to analyze and synthesize information to assist with impaired reasoning and problem solving.

9.0 Evidence Sources: Executive Functions, Reasoning, Problem Solving, Metacognition	Recommendations Supported
INCOG Tate et al., 2014 & Jaffay et al., 2023*	9.2, 9.3, 9.4, 9.5, 9.6
INESS Guidelines, 2014	9.2, 9.4, 9.5, 9.6, 9.7
Raymer, 2018	9.2
Meuller & Dollohan, 2013	9.1
Cornis-Pop et al., 2012	9.1, 9.2, 9.4, 9.5

*INCOG Guidelines 1.0 (Tate et al., 2014) were cited in the initial version of the CCEAS-Map. INCOG Guidelines 2.0 (Jaffay et al., 2023) were recently published, reviewed, and added.

10.0	Comprehension and Information Processing Auditory and Reading Comprehension & Instructional Practices
10.1	**Assessment of Comprehension & Information Processing:** My assessment of auditory comprehension and information processing integrates information regarding the multiple influences on understanding including the influences of attention, memory, speed of processing, linguistic processing, context, emotional, and physical (e.g., auditory, sleep) influences. It includes a combination of standardized testing, observation in various communication contexts, self and family report, and analysis of communication partner influences (e.g., speed, topic switching, redundancy, etc.). In my formulation of the person's strengths and weaknesses I draw on a rich body of literature on auditory and reading comprehension, linguistic factors, influence of cognitive and linguistic and environmental complexity. I consider various components of comprehension mindful of both linguistic and cognitive complexity (e.g., metaphor, inference, ambiguity, anaphoric reference, organization, emotion perception, prosody perception, etc.). My findings and recommendations include examples of potential difficulties in daily life situation in which the individual may have difficulties in understanding (e.g., following instructions, conversation, discussions) and reading (e.g., reading for pleasure, academics, work, daily tasks).
10.2	**Treatment for Comprehension and Information Processing:** I plan comprehension interventions that are tailored to the individual's areas of cognitive-communication challenge and the resulting impact on daily comprehension. My interventions for comprehension and information processing incorporate a number of evidence-based practices including metaphor interpretation methods, ambiguity methods, compensatory strategies, metacognitive strategy instruction, and executive functions strategies for managing information.
10.3	**Instructional Practices:** I utilize evidence-based instructional practices to enhance information process-ing and new learning (e.g., systematic instruction, error minimization, high rates of correct practice, generalization, metacognitive-strategy instruction, etc.).
10.4	**Gesture:** I recognize that gestures used by the individual or the speaker may assist in comprehension, memory, and learning and I trial these strategies in comprehension intervention.
10.5	**Comprehension for Vocational:** I provide assessment and treatment of comprehension and educate others that comprehension is a key indicator for vocational re-integration.
10.6	**Reading Interventions:** I provide a variety of evidence-based reading interventions at multiple levels including impairment based, activity based, cognitive reading strategies (e.g., highlighting, identifying the main points, wh-questioning, re-reading, summarizing, reducing visual load, etc.), and metacognitive strategies.

10.0 Evidence Sources: Comprehension & Information Processing	Recommendations Supported
CASLPO 2015	10.1
O'Neill Pirozzi et al., 2021	10.5
Clough & Duff, 2020	10.4
Watter et al, 2016; Watter et al., 2017	10.6
Blake et al., 2013	10.1, 10.2
Cornis-Pop et al., 2012	10.1, 10.2

11.0	**Expression and Discourse Planning: Verbal and Written** *(note: Discourse evaluation applies to this section as well as the Social Communication section)*
11.1	**Assessment: Word Retrieval:** I assess word retrieval recognizing that verbal fluency measures are often more sensitive than confrontation naming and that additional analysis, beyond word count alone, may be beneficial (e.g., clustering, error types).
11.2	**Assessment: Cognitive Influences on Communication:** I recognize the complex relationship between cognitive functions (attention, working memory, executive functions) and discourse planning and my assessment of discourse and social communication is informed by a model that reflects these multifactorial relationships including: cognitive, communication or linguistic, emotional, physical, control functions.
11.3	**Assessment: Non-Standardized/Contextual Assessment:** My assessment includes a range of non-standardized evaluations (also called contextual evaluation) in addition to standardized testing. Non-standardized assessments include discourse analysis, functional assessment measures, SLP observation reports, clinical interview, and pragmatic and social communication rating scales that include the perspectives of the individual as well as close others.
11.4	**Assessment: Discourse Sampling & Analysis:** I recognize that a person may do well in monologic discourse in assessment but be more challenged in conversation. I assess both monologic (analysis of productivity, efficiency, content accuracy, organization, story grammar) and conversational discourse (initi-ation, manipulation of content, conversational repair). I assess a variety of genres of discourse (procedur-al, narrative, expository, persuasive, conversational). I therefore emphasize the importance of discourse for social competence when sampling and analyzing. I am aware that there are several newer methods of discourse assessment that are both sensitive and practical and these are summarized in seminal dis-course and social communication articles for SLPs.
11.5	**Treatment:** I provide comprehensive evidence-based interventions for verbal expression that include word retrieval strategies, discourse planning strategies (e.g., modeling, recording, self-evaluation, script-ing, hierarchical cues, metacognitive strategies, tailored practice, generalization activities, real world practice, feedback, and incorporation of strategies into daily life communication contexts.

11.0 Evidence Sources: Expression & Discourse Planning	**Recommendations Supported**
CASLPO 2015	11.1, 11.3
Steel et al., 2021	11.2, 11.3, 11.4
Hardin et al., 2021	11.1, 11.2;, 11.3, 11.4
Sohlberg et al., 2019	11.2, 11.3, 11.4
Hill et al., 2018	11.3, 11.4
MacDonald et al., 2017	11.2
Thiel & Quinting 2016	11.1
Barman et al., 2016	11.5
Blake et al., 2013	11.2, 11.4, 11.5

PART 4

Interventions for Return to Activities and Life Participation

12.0	Family and Community Communications: Communications Required for Family and Community Re-Integration
12.1	**Family Hospital Involvement:** I support and encourage family involvement during inpatient rehabilitation as it can improve cognitive functioning and return to community participation after discharge.
12.2	**Family Ongoing Involvement:** I engage families in cognitive-communication rehabilitation to maximize outcomes.
12.3	**Communication Partners:** I recognize the critical role that communication partners can play in supporting communication and I provide training to communication partners including paid carers, family members, other everyday communication partners, professionals, and community members.
12.4	**Technology:** I use assistive technology as a compensatory tool to support day to day activities (e.g., work productivity, memory, medication schedules, using email, self-initiated behaviours, etc.).

12.0 Evidence Sources: Family and Community Communications	Recommendations Supported
CASLPO 2015	12.1, 12.4
INESS Guidelines, 2014	11.1, 11.2
Behn et al., 2021	12.1, 12.2, 12.3
Wiseman-Hakes et al., 2021	12.1, 12.2, 12.3
Grayson et al., 2020	12.1, 12.3, 12.3
Bogner et al., 2019	12.1, 12.2
Brunner et al., 2017	12.3
Barman et al., 2016	12.4

13.0	Social Participation (Social Communication & Social Cognition)
13.1	**Assessment of Social Communication:** Given that social communication is the interaction of two or more people in context, I assess social communication in conversation contexts with a variety of communication partners. My social communication assessment includes interview with the individual and family about their social communication concerns and priorities, clinician reported observation measures designed for ABI, individual and close other reported observation measures designed for ABI, conversational discourse sampling and analysis, and performance-based measures (i.e., standardized discourse tasks) as indicated. I consider the communication contexts, the cognitive-communication demands, the communication partners, the conversational genres (e.g., communication with a child, instructing co-worker, social chat with friends) and a variety of cognitive-communication factors that influence social communication and formulate goals collaboratively with the client and close others.
13.2	**Cognitive-Communication:** I provide cognitive-communication therapy to improve social communication.
13.3	**Individual Social Communication Interventions:** I provide evidence-based social communication interventions that are carefully and collaboratively constructed with the individual and close others and employ a range of evidence-based techniques (e.g., personalized communication goals, cues, practice in varied contexts, recording, self-evaluation, etc.). I guide the individual in careful selection of goals, scripts, cues, and strategies that are aligned with their specific communication targets, preserved strengths, real world communication targets, contextual challenges, and their goals and preferences.
13.4	**Group interventions:** I provide group interventions for social communication that may include: education, collaborative goal setting, real world practice, opportunities for unstructured social interaction, recording, self-evaluation, employment of individualized strategies, etc. Key benefits of group interventions can be peer support, communication practice in an accepting environment, refinement or altering of outcome targets, opportunities for community participation, building friendships, and more. I am aware that there are multiple important considerations in group interventions and the timing and type of group experience must be tailored to the individual's needs, goals, and preferences.
13.5	**Communication Partner Training:** I provide communication partner training to both familiar and unfamiliar communication partners and measure the effectiveness of intervention using outcomes for both familiar and unfamiliar communication partners.
13.6	**Augmentative & Alternative:** I provide augmentative-alternative communication training if/when it is indicated.
13.7	**Social Cognition:** I provide or partner with a psychologist who provides targeted interventions to address social cognition deficits including interventions targeting social perception, emotion perception, theory of mind, emotional empathy, alexithymia, and social functioning.

13.0 Evidence Sources: Social Communication	Recommendations Supported
INCOG Togher et al., 2023	13.1, 13.2, 13.3, 13.4, 13.5, 13.6, 13.7
Behn et al., 2020	13.5
Wiseman-Hakes et al., 2020	13.5
Raukola-Lindblom et al., 2020	13.4
Meulenbroek et al., 2019	13.2, 13.3, 13.4
Sohlberg et al., 2019	13.1
Roelofs et al., 2017	13.1, 13.2
Berman et al., 2016	13.1
Finch & Copley, 2016	13.1, 13.2, 13.3, 13.4
Cornis-Pop et al., 2012	13.1, 13.2, 13.3
Institute of Medicine, 2011	13.2

INCOG Guidelines 1.0 (Togher et al., 2014) were cited in the initial version of the CCEAS-Map. INCOG Guidelines 2.0 (Togher et al., 2023) were recently published, reviewed, and added.

*INCOG Guidelines 1.0 (Togher et al., 2014) were cited in the initial version of the CCEAS-Map. INCOG Guidelines 2.0 (Togher et al., 2022) were recently published, reviewed, and added.

14.0	School & Lifelong Learning: School Re-integration or Cognitive-Communication for Academic or Learning Pursuits *(secondary school, college, university, upgrading, training, continuing education)*
14.1	**School Transition & SLP:** As an SLP I participate in the interdisciplinary team to assist high school, college or university students with ABI in school re-integration, academic support, accommodations, and education of stakeholders regarding cognitive-communication challenges.
14.2	**SLP Academic Intervention:** I provide direct SLP intervention to assist students with ABI throughout the school year with assessment, placement, academic accommodations, consultation, provision of specific strategies, academic problem solving, and supports.
14.3	**SLP Cognitive-Communication Strategies for School:** I draw on the extensive literature on CCD supports for students with ABI and develop an individually tailored program for the student using personalized goal development, collaborative coaching, metacognitive strategies, collaborative proactive communications, and engagement with the student and their academic, family, peer, and social supports.

14.0 Evidence Sources: School & Lifelong Learning	Recommendations Supported
Ackley Brown 2020	14.1, 14.2, 14.3
O'Brien et al., 2021	14.1, 14.2, 14.3
Kennedy et al., 2012	14.1, 14.2, 14.3

15.0	Work Vocational Re-Integration, Workplace Communications, or Communications for Meaningful Productive Activity or Volunteering
15.1	**Vocational Assessment:** I educate and advocate for adults with ABI to be assessed for the need for vocational rehabilitation or support to assist return to work when considering discharge.
15.2	**SLP & Vocational:** I contribute to the vocational evaluation and plan for vocational rehabilitation because communication skills, including not only expressive but also receptive skills, are critical to workplace suc-cess.
15.3	**Vocational Re-Integration Plan:** I recognize that gradual Vocational Re-integration after ABI should include a plan for evaluating limitations and restrictions, implementing accommodations or supports and tailored pre-work or work trials, with ongoing evaluation and incremental increase in responsibility, time, scope, level, or independence at work.
15.4	**Cognitive-Communication Interventions and Vocational:** To optimize the potential for return to work I provide assessment and treatment of the following cognitive-communication functions found to be key to vocational success: memory, problem solving, comprehension, expression, social interaction, attentio, and executive functions.

15.0 Evidence Sources: Work	Recommendations Supported
Meulenbroek et al., 2021	15.1, 15.2, 15.3, 15.4
O'Neill-Pirozzi et al., 2021	15.2
Stergiou-Kita et al., 2011	15.1, 15., 15.3, 15.4

16.0	Information Management
16.0	**Cognitive Communication independence in Management of Information including:** Health, Rehabilitation, and Wellness Support Communications Financial, Legal, and Insurance Communications Self-Advocacy, Consulting, and Collaboration Communications (e.g. Co-Design, Guideline Development)

17.0 Glossary of Terms

Acquired brain injury (ABI): These are injuries to the brain that occur after birth due to a variety of causes including traumatic brain injury, concussion, stroke, neural infection (encephalitis, meningitis), hypoxia (i.e. loss of oxygen due to cardiac arrest, carbon monoxide poisoning etc.), tumour, seizures, surgery, electrocution. ABI's are non-progressive and exclude deteriorating conditions such as dementia, multiple sclerosis or Parkinson's disease.

Close Other: "CO" The term "close other" refers to any family member or friend who has a close relationship with the person and provides support.

Cognitive-Communication Disorders (CCD): These are communication challenges in auditory comprehension, verbal expression, reading comprehension, written expression, and social communication, that occur as a result of underlying cognitive impairments in attention, memory, organization, reasoning, speed of processing, working memory or executive functions. These are unique from other types of communication disorder (e.g., aphasia, apraxia, motor speech, voice, stuttering). Acquired CCD discussed in this document are non-progressive in nature and do not include CCD related to progressive conditions (e.g. dementia, multiple sclerosis). Dysphagia or swallowing difficulties are also not addressed in this document.

Communication Partner: Communication partners (CP) refer to those who interact with the individual and therefore require support , education, and training to assist the person with brain injury. This may include family, friends, community members & volunteer co-ordinators, teachers etc.

Disorders of Consciousness (DOC): This refers to individuals in coma, vegetative, or minimally conscious states (MCS) due to severe brain injury. For specific definitions and more detail about SLP practice see guidelines referred to in this section. For brevity we will use the general term DOC.

Individual: The terms "individual" or "person" are used rather than "patient" or "client" to refer to an individual with a brain injury.

PWLE: Persons with lived experience of brain injury include the individual who was injured and any family or close others who provide support.

SLP or SLT: Speech-language pathologist (SLP) and (SLT) speech-language therapists are the same professions with slightly different names in different regions. SLP's and SLT's are regulated health professionals with specialized expertise in assessing and treating individuals with communication disorders.

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