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Kelly, Michelle; McDonald, Skye; Frith, Matthew H.; "A survey of clinicians working in brain injury rehabilitation: are social cognition impairments on the radar?". Published in Journal of Head Trauma Rehabilitation Vol. 32, Issue 4, pp. e55-e65 (2017)

Available from: <http://dx.doi.org/10.1097/HTR.0000000000000269>

Accessed from: <http://hdl.handle.net/1959.13/1327528>

1 A survey of clinicians working in brain injury rehabilitation: Are social cognition
2 impairments on the radar?

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12 *Funding:* This research was funded by Lifetime Care and Support Authority.

13 *Acknowledgements:* The authors would like to acknowledge the busy clinicians who
14 took time to complete this survey.

15 *Conflicts of interest:* No conflicts of interest are declared.

16 *Ethical adherence:* This study was approved by the Hunter New England Local Health

17 District Human Research Ethics Committee (LNR/13/HNE/497;

18 LNRSSA/13/HNE/498).

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30 *Objectives:* To examine the social cognition assessment practices of clinicians working
31 with children and adults with traumatic brain injury (TBI). *Main Measures:* Online
32 survey addressing frequency of social cognition impairments, how these are assessed
33 and obstacles to same, and treatment practices. *Participants:* 443 clinicians worldwide
34 working in inpatient and outpatient settings. *Results:* Whilst 84% of clinicians reported
35 that more than half of their clients with severe TBI had social cognition impairments,
36 78% of these reported that they infrequently or never assessed these domains using a
37 formal assessment tool. Lack of reliable tests was most frequently (33% of respondents)
38 cited as the greatest barrier to undertaking social cognition assessment. *Conclusions and*
39 *Implications:* Improvements are needed in the development and norming of instruments
40 capable of detecting social cognition impairments in the TBI population. Additional
41 training and education are needed in the use of social cognition assessment tools.

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48 **Keywords:** traumatic brain injury, survey, clinician, staff, social cognition, social
49 function, assessment, assessment practices

50 **Introduction**

51 While various cognitive, social, and physical characteristics associated with
52 traumatic brain injury (TBI) may influence psychosocial outcomes^{1,2}, it is the changes
53 to personality and social functioning that are seen to be most distressing for the person,
54 their family and the community^{3,4}. Changes in social functioning observed after
55 acquired brain injury, particularly trauma-related injury, include impulsive and
56 inappropriate behaviour, conversational difficulties such as failure to initiate speech or
57 to stay on topic, and poor integration of social cues and knowledge⁵⁻⁸. The skills
58 necessary for correctly recognising and comprehending social cues from the
59 environment in order to produce an appropriate response are collectively referred to as
60 social cognition. These skills include the identification of emotions expressed through
61 the face, tone of voice and postures, as well as the ability to empathise with another, to
62 understand that another person has different thoughts than oneself and to predict their
63 intentions (known as ‘theory of mind’), and the ability to synthesize this information in
64 order to form and enact an appropriate response⁹. In normal circumstances and among
65 cognitively intact individuals, these functions typically occur seamlessly in day-to-day
66 life without conscious awareness of the complex processes underlying them. However,
67 failure to interpret social cues can lead to misunderstandings¹⁰, conflict and, with time,
68 irreparable damage to relationships¹¹.

69 The prevalence of social cognition disorders in adults with moderate-severe TBI
70 is not well-established, but estimates range from 13-39% experiencing emotion
71 perception deficits¹² and up to 70% self-reporting low empathy¹³⁻¹⁵. Similarly in
72 children, deficits in theory of mind and emotion perception are seen following TBI^{16,17};

73 however, the assessment and management of these impairments in children is further
74 challenged by neurodevelopmental stage¹⁸.

75 Examination of social cognition is not traditionally part of a typical battery of
76 cognitive assessment. The two professions most likely to focus on social cognition are
77 clinical neuropsychology and speech pathology. However, the former tends to restrict
78 assessment to non-social functions while the latter tends to restrict assessment to
79 language-based skills. Despite this, there are a number of emerging and established
80 methods for examining social cognition. A practical and simple approach is the use of a
81 self-report questionnaire, such as the Balanced Emotional Empathy Scale (BEES)^{19,20}.
82 This requires the person with TBI to rate their level of agreement or disagreement with
83 statements about real life emotional stimuli, (e.g., “I can almost feel the pain of elderly
84 people who are weak and must struggle to move about”). Another instrument is the
85 Social-emotional Questionnaire (SEQ)^{21,22} which is a 30-item self- and carer-rated
86 report of social behaviour. Although self-report tools have been criticised for their
87 validity and reliability as they are vulnerable to problems with insight and language
88 comprehension that are common following TBI, there is some evidence for their
89 validity even in people with severe injuries²³. While proxy-rated tools are also
90 vulnerable to biases based on carer stress levels and stage of recovery of the person with
91 TBI^{4,24}, informant ratings on instruments such as the BEES and the SEQ have proven to
92 be reliable in research settings^{4,15}.

93 Performance based assessment tools are also available for use in people with
94 TBI. Many of these attempt to mimic real world stimuli by using items such as still life
95 photographs of faces expressing different emotions or social settings where the person
96 is required to respond with an accurate representation of the feelings or thoughts of

97 characters in the photograph (e.g., Facial Expressions of Emotion Stimuli and Tests
98 (Ekman⁶⁰)²⁵. Others use text based stories to determine whether participants can
99 understand the thoughts of story characters in order to detect how and why a social faux
100 pas occurred²⁶. While these types of tools provide insight into social cognition
101 impairments, they have not been proven to predict real world behavioural
102 difficulties^{27,28}. On the other hand, The Awareness of Social Inference Test (TASIT)²⁹
103 is a well-validated assessment tool that requires the person with brain injury to view a
104 series of vignettes of trained actors depicting real-life situations. The person is asked to
105 identify the emotions the actors are expressing, report on the characters' thoughts and
106 identify sarcasm and white lies. TASIT is sensitive to social cognition impairments and
107 also predictive of real world difficulties³⁰. For a review of all instruments available for
108 social cognition assessment in TBI see ^{9,31}.

109 Whilst instruments such as those mentioned above are available to clinicians
110 working in brain injury rehabilitation, it is unclear whether clinicians are aware of these
111 tests and utilise them in everyday practice. Indeed, there is very little research into what
112 influences assessment choices for clinicians. Evidence-based guidelines are available to
113 clinicians through various governing bodies and might be expected to be the single most
114 important factor influencing decision-making regarding assessment approaches. Many
115 guidelines, including those from Australia, New Zealand, and United Kingdom³²⁻³⁴,
116 recommend that the clinician note changes in behaviour, personality and mood, as well
117 as barriers to social participation ³⁴. However, these guidelines do not direct the assessor
118 to test social cognition or provide guidance on available instruments. The discipline
119 specific guidelines produced by the Academy of Neurologic Communication Disorders
120 and Sciences³⁵ do review a social cognition assessment tool (TASIT); however, these

121 guidelines are not well cited³⁶ and it is unclear whether they are available to those who
122 are not members of the academy. Overall, there seems little explicit information
123 available to clinicians with regard to the assessment of social cognition, despite its
124 central importance in interpersonal function and psychosocial rehabilitation.

125 The aims of the following study were to survey clinicians working in brain
126 injury rehabilitation and identify:

- 127 1) the frequency with which:
 - 128 a) patients and families complain of social cognition impairment
 - 129 b) social cognition is assessed by clinicians working in TBI and the prompts to
130 undertake this assessment
 - 131 c) various domains of social cognition are assessed
- 132 2) the process undertaken to assess social cognition and whether this is dependent on
133 the clinician's years of experience and/or level of qualification
- 134 3) the perceived obstacles to the assessment of social cognition in the TBI population
135 as reported by clinicians
- 136 4) the frequency with which clinicians engage in social cognition rehabilitation with
137 clients who report social cognition impairment

138 Given the lack of comprehensive clinical guidelines publicly available for assessing
139 social cognition, we hypothesise that the frequency with which social cognition is
140 assessed will be less than the frequency with which social cognition impairments are
141 reported/observed, and subsequently treated in people with TBI. Given the paucity of
142 standardised assessment tools identified for the assessment of social cognition, we

143 predict the majority of clinicians would utilise clinical interviewing skills when they do
144 examine social cognition, rather than standardised tests.

145 **Methods**

146 Survey Development (see supplemental digital content for full detail)

147 The survey was composed using the following strategy, 1) A review of the
148 literature to identify areas of social cognition being investigated in experimental and
149 clinical research; 2) Consultation with a multidisciplinary brain injury rehabilitation
150 team; and, 3) Consultation with a social cognition and TBI research group (see Table 5
151 for final list of social cognition domains). The survey was then constructed with input
152 from the coinvestigators and piloted with clinicians. Demographic and workplace
153 setting data was collected. Questions were carefully ordered to avoid expectation bias.

154 Fixed anchor points are posited as being more reliable when making quantitative
155 comparisons³⁷ and accordingly were used for the majority of survey questions. For
156 example, the percentage of clinical time spent assessing an area of social cognition was
157 rated on a scale with anchor points; never (0%), infrequent (<25%), somewhat frequent
158 (25-50%), frequently (51-85%), and routinely (>85%). Open-ended questions were also
159 utilised, for example, to determine what would prompt a clinician to assess for social
160 cognition impairments. Ranking style questions were also used; for example,
161 respondents were asked to rank a prescribed list of barriers to assessment.

162 Survey Dissemination

163 Clinicians working in TBI rehabilitation were identified via a number of
164 professional networks as well as local brain injury services (see Table 1 for source of

165 clinicians). These clinicians were invited to complete an online survey via email
166 invitation which included a web link to Survey Monkey (www.Surveymonkey.com).
167 This link was not personalised for any one participant, and as a result, was forwarded by
168 clinicians to other potential respondents. A welcome consequence of the various
169 recruitment strategies was that the survey was disseminated worldwide, but this meant
170 that response rate could not be deduced. The survey remained open for one month, and
171 one reminder email was sent during this time. This study was approved by the Hunter
172 New England Local Health District Human Research Ethics Committee
173 (LNR/13/HNE/497; LNRSSA/13/HNE/498).

174 TABLE 1 ABOUT HERE

175 Definitions

176 The respondents were provided with the following definition of **social cognition** to
177 assist with validity of responses and to encourage respondents to think broadly about the
178 concept.

179 *Social cognition is defined as: the capacity to understand and interact with others in*
180 *contextually appropriate ways, that is, the storage and processing of social information,*
181 *along with the ability to produce appropriate responses with social partners.*

182 Analyses

183 Responses from Survey Monkey software were downloaded into IBM Statistical
184 Package for the Social Sciences Version 23 (SPSS-23). Procedures were executed to
185 ensure that each clinician contributed only one survey response. Descriptive statistics
186 are presented for most responses. Chi-square analyses were conducted on categorical

187 and ordinal data³⁸ to determine which responses were driving group differences³⁹. For
188 this purpose, years of experience was classified into 10 years or fewer and greater than
189 10 years. Level of qualification was classified into postgraduate (Masters, Professional
190 Doctorate or PhD) or undergraduate (Honours or less).

191 **Results**

192 Participants

193 Demographic characteristics of the sample are presented in Table 2. Of the total
194 of 535 survey responses collected, 92 were removed due to duplication or abandonment,
195 leaving a total of 443 participants. Of respondents, 77.9% were female. 58.7% were
196 from Australia, with the United Kingdom (13%) and the United States of America
197 (7.5%) being the next largest contributors. Nearly all (96.8%) of participants had
198 completed a Bachelor's degree, with 58.6% of these also having completed a Master's
199 degree, Professional Doctorate or PhD. The majority of respondents were employed as
200 Speech and Language Pathologists (21.7%), Clinical Neuropsychologists (18.5%) or
201 Occupational Therapists (15.6%). The range of experience varied greatly with the
202 minority (8.6%) having worked in brain injury rehabilitation for fewer than 12 months
203 and a large proportion (46%) having worked in this field for over 10 years. On average
204 respondents were spending 26.37 hours ($SD = 13.55$) per week working in brain injury
205 rehabilitation; however, again this varied greatly (range = 1-80 hours).

206 TABLE 2 ABOUT HERE

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231 working in this population were very aware of social cognition impairment following
232 TBI. Therefore, the next step was to determine how well it was assessed and treated.

233 Clinician practices when assessing social cognition

234 The many reasons cited as prompts for social cognition assessment are listed in
235 Table 4¹. The two most commonly cited reasons for undertaking social cognition
236 assessment were: 1) family reports of change to personality/behaviour (31%), and 2)
237 client reports of difficulties with relationships with partner/family (29%).

238

239 TABLE 4 ABOUT HERE

240

241 Whilst many domains fall under the umbrella of ‘social cognition’, *insight* and
242 *disinhibition* were most commonly cited as part of a clinician’s ‘routine’ assessment.
243 However, almost half (45%) of the clinicians reported that they never assessed *theory of*
244 *mind*, whilst one quarter (24.7%) reported that they never assessed *facial affect*
245 *recognition*. Other neglected areas of assessment included *alexithymia* (55%),
246 *understanding body language* (27%), *social faux pas* (30%) and *sarcasm* (30%). See
247 Table 5 for frequency of assessment of each social cognition domain. Please note, for
248 this analysis only those who might be expected to conduct social cognition assessment
249 were included. That is, only data from social workers, clinical/psychologists, clinical
250 neuropsychologists, speech and language pathologists and occupational therapists were
251 included.

252

¹60% of clinicians provided appropriate responses to this question. A proportion of respondents ($N = 47$) misinterpreted the question, instead responding with the barriers to them undertaking social cognition assessment. These are addressed later.

TABLE 5 ABOUT HERE

253

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255 Interestingly, even when social cognition was assessed, the assessment method that
256 clinicians most routinely utilised was '*structured or semi-structured interview*' with the
257 client and/or family. '*Formal assessment using a standardised test*' was the least
258 commonly employed method of assessing social cognition with 78% of respondents
259 reporting that they *never* or *infrequently* utilised this method (See Figure 1). Of
260 importance, a Pearson Chi-Square revealed that the frequency with which clinicians
261 used '*semi-structured or structured interview*' with family/client depended on years of
262 experience [$\chi(4) = 19.79, p = .001$]. An adjusted standardized residual of 4.0 indicated
263 that those clinicians with greater than 10 years' experience were significantly more
264 likely to routinely assess social cognition using '*semi-structured or structured*
265 *interview*' with family/client than were clinicians with fewer than 10 years' experience.
266 Furthermore, significant differences were noted for the use of '*formal assessment tools*
267 *with normative data*', dependent on level of qualification [$\chi(4) = 12.06, p = .017$]. An
268 adjusted standardised residual of 2.2 indicated that those clinicians with postgraduate
269 training were significantly more likely to routinely undertake social cognition
270 assessment using a '*formal assessment tool with objective normative data*' than those
271 without postgraduate training. No other differences were revealed between years of
272 experience or level of qualification and other assessment methods.

273

FIGURE 1 ABOUT HERE

274

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276 Failure to assess social cognition with an empirically validated assessment tool was not
277 without reason. The lack of ‘availability of reliable tools/tests’ was most frequently
278 (33% of respondents) rated as the largest barrier to the assessment of social cognition.
279 In addition, respondents reported that this was potentially even more problematic in
280 countries where English was not the first language. ‘Confidence (lack of training)’ to
281 conduct the assessment and ‘time to conduct assessment’ were the next most commonly
282 cited reasons for not assessing social cognition (19% and 17.5% respectively). See
283 Figure 2. Furthermore, the Diagnostic and Statistical Manual of Mental Disorders
284 version 4 (DSM-IV) was a perceived barrier, as it does not include social cognition
285 impairments amongst the sequelae of TBI (although the DSM-V does). Another
286 common response was that the assessment of social cognition was another team
287 member’s (discipline’s) role. It is interesting to note that respondents who stated this
288 identified as Speech and Language Pathologists, Clinical Neuropsychologists, Clinical
289 Psychologists and Occupational Therapists. Furthermore, these disciplines were all
290 viewed by another discipline to be the one responsible for social cognition assessment.
291 Despite the infrequency of social cognition assessment undertaken by clinicians, 34%
292 reported (agreed or strongly agreed) that standardised assessment was useful for the
293 provision of information for goal setting around social cognition rehabilitation needs,
294 and 78% strongly/agreed that informal assessments (interview with client/family) were
295 most useful for informing social cognition rehabilitation planning². Of concern, the
296 majority (63%) of clinicians estimated that social cognition impairments were left
297 untreated in half of all patients that present with these difficulties.

298 **FIGURE 2 ABOUT HERE**

² Please note that these were two separate questions; hence, the figures add to greater than 100%.

299

FIGURE 3 ABOUT HERE

300 **Discussion**

301 The primary objective of this study was to identify the assessment practices of
302 clinicians working in traumatic brain injury (TBI) rehabilitation with a specific focus on
303 the assessment of social cognition.. This international survey of clinicians is the first (to
304 the authors' knowledge) that aimed to determine whether there is a gap between
305 evidence and practice with regard to social cognition assessment, and therefore stands
306 as an unmet need in the area of TBI rehabilitation.

307 Survey respondents represented a range of clinicians working in varying
308 disciplines on brain injury teams, with more than half having achieved postgraduate
309 level education. Clinicians reported mainly working with those over the age of 18 years
310 with only 12% of respondents working with children. This is consistent with the
311 prevalence of brain injury across age groups¹⁷. The majority of respondents reported
312 working with clients with all levels of brain injury severity. Approximately half of these
313 were in community rehabilitation settings or private practice with just under half in in-
314 patient settings. Thus, we were reasonably assured that we had a representative sample
315 of TBI rehabilitation clinicians in the current sample.

316 Overall clinicians working in this field reported that social cognition impairment
317 was present both from their perspective and those of the person with TBI and their
318 family, consistent with the growing literature in this field^{6,9,40-46}. Not surprisingly,
319 prompts for the clinician to assess social cognition included reports from the family of
320 changes to personality and behaviour and reports from the person with TBI about
321 relationship difficulties. Despite the high frequency of social cognition impairment

322 complaints from the client and awareness from the clinical team, particularly within the
323 severe TBI group, the frequency with which social cognition assessment in this
324 population was undertaken was low. In fact, the majority of clinicians reported that
325 social cognition did not form a part of their standard assessment battery. For example,
326 45% of clinicians reported that they never assessed theory of mind (ToM: the ability to
327 think about others' thoughts) using faux pas or other tasks. This is despite the fact that
328 people with severe TBI are known to experience moderate-severe ToM deficits⁴⁷. Also,
329 one-quarter of respondents reported that they never assessed facial affect recognition or
330 comprehension of body language, despite the fact that it is estimated that 13-39% of
331 adults with moderate to severe TBI have facial affect recognition impairments¹². The
332 prevalence rates are unclear for body language comprehension⁴⁸ but are presumably
333 similar. Approximately 24-30% of clinicians reported never assessing pragmatic
334 language or the capacity to detect sarcasm. Again, research has shown that
335 approximately one-third of people with TBI are impaired in these domains⁴³. Finally,
336 more than half of clinicians reported that they never assess alexithymia, a condition
337 characterised by poor emotional self-awareness and inability to describe emotions,
338 which is seen in around 60% of people following TBI⁴⁹. Therefore, there was a clear
339 distinction between the prevalence of social cognition impairment in this group and the
340 provision of social cognition assessment by clinicians working in this field. Insight and
341 disinhibition were most commonly cited as being assessed, though notably, these could
342 be classified as more 'cognitive' rather than 'social-cognitive' domains, again
343 supporting the assumption that clinicians spend more time focused on other areas of
344 assessment. Whilst significant differences in social cognition assessment practices
345 might be predicted between those disciplines from allied health backgrounds

346 (occupational therapy, psychology) versus those from medicine (e.g., rehabilitation
347 physicians, nurses), frequency data presented in Table 5 reveal little difference
348 regardless of whether the entire sample or just those who might be expected to conduct
349 this form of assessment were included in analyses.

350 Most clinicians reported that they infrequently or never use standardised tests of
351 social cognition. Rather, the most common method was interview with the patient
352 and/or their family, an approach favoured by experienced clinicians. This suggests that
353 those with more experience are potentially more mindful of problems with social
354 functioning following TBI, but are also either unaware of validated assessment tools
355 available for use in this population (e.g., TASIT), and/or are wary of the limitations of
356 available instruments. Indeed clinicians reported that the lack of reliable and appropriate
357 standardised tests for assessing social cognition was the biggest barrier to undertaking
358 social cognition assessment. This could be a result of either the tools not yet being
359 easily accessible or a lack of awareness of what tools are commercially or otherwise
360 available.

361 Another commonly reported barrier was the lack of tools available in languages
362 other than English. Whilst parts of the TASIT have now been translated into languages
363 such as Danish⁵⁰ and Dutch⁵¹, these are not yet standardised and available for clinical
364 use. This could be rectified through further international collaborations.

365 Another barrier highlighted by clinicians was their lack of confidence in their
366 ability to assess social cognition due to a lack of training in this domain. Whilst some
367 brain injury research groups and professional associations are working to rectify this
368 through the provision of professional development workshops, webinars etc. (for

369 example see <http://www.assbi.com.au/workshops.html>, <http://www.biausa.org/biaa->
370 [events.htm](http://www.biausa.org/biaa-events.htm), <http://ukabif.org.uk/events/>), it is unclear whether the skills for assessing
371 social cognition are being covered in tertiary education programs, and this question is in
372 need of further investigation.

373 It was not surprising that time was also noted to be a significant barrier to
374 undertaking social cognition assessment. There are many competing areas of assessment
375 both within in-patient brain injury rehabilitation settings and transitional living units
376 (longer-term rehabilitation facilities) as well as out-patient settings. Clinicians are under
377 pressure to support the person with educational and occupational reintegration in
378 addition to return to independent living. These goals, whilst important, often necessitate
379 the treatment focus on physical rehabilitation. When general cognition and language are
380 addressed, the focus is often on the assessment of memory, attention, and functional
381 communication skills (cognitive communication/aphasia) rather than social
382 domains^{36,52}. If rehabilitation services are fragmented and under-staffed, clinicians
383 struggle to provide comprehensive rehabilitation services in core areas, let alone new, or
384 hitherto unrecognised areas of assessment⁵³. Paradoxically, the social factors, the
385 inability to understand the feelings and intentions of family members have a larger
386 detrimental impact on the quality of life for the person with brain injury than memory
387 impairment or physical disability^{3,4}. This lack of priority placed on the assessment of
388 social cognition may soon change as tertiary education begins to align with the updated
389 diagnostic manual, the DSM-5⁵⁴. The DSM-5, as opposed to the DSM-IV, now
390 highlights social cognition changes as a sequelae of brain injury⁵⁵ and it is anticipated
391 that these changes will filter into formal training settings.

392 As a logical consequence of the barriers highlighted above, the majority of
393 clinicians reported that social cognition impairments were left untreated in at least half
394 of all patients reporting these difficulties. This aligns with the historical paucity of
395 evidence for treatments of social cognition in TBI. Despite this, empirical studies are
396 emerging⁵⁶⁻⁶⁰ in the TBI literature, and there is a wealth of evidence for similar
397 treatments in other populations such as those with schizophrenia⁶¹. Similarly, there is
398 evidence for the efficacy of social skills training in TBI⁶²⁻⁶⁴ as well as social
399 communication training⁶⁵. Overall, however, research into social cognition remediation
400 in TBI is under-developed, especially in comparison to the schizophrenia field. Whilst
401 this finding was anticipated, it is not acceptable. Given the level of social isolation in
402 this group^{66,67} we as clinicians and researchers should be focused on the skill set that is
403 pivotal to social reintegration. Future research should focus on increasing the level of
404 systematic evidence for social skills remediation programs and actively disseminating
405 any currently available tools to clinicians who are equipped to work in this area.

406 Limitations

407 Whilst this survey has provided much needed information from the clinicians'
408 perspective on social cognition assessment practices with people with TBI, there are
409 limitations. As a consequence of keeping it brief, the survey lacked depth into
410 explanations of responses. For example, it would have been useful to collect data from
411 rehabilitation teams (with identifiers) and request information regarding who on each
412 team was perceived to be responsible for social cognition assessment. Whilst this was
413 addressed informally through open responses, a formal question would have enabled
414 this data to be crosschecked and quantified. Whilst we were unable to do this, what did
415 become clear from the responses available was that most thought it was another

416 discipline's role. The fact that social cognition assessment is "falling between the
417 cracks" is a major concern. Indeed, there is also a very clear possibility that members of
418 a multidisciplinary team do not have a reliable understanding of what other disciplines
419 do as part of their role⁶⁸. The team member responsible for social functioning
420 assessment is also likely to vary somewhat between teams. Future research should also
421 ascertain more detail about barriers to treating social cognition, although many of the
422 same barriers may be relevant. Moreover, it would have been useful to know whether
423 clinicians are being guided in their assessment by particular locally produced or national
424 guidelines. One final limitation was the over representation of Australian clinicians,
425 with only small contributions from other countries including United Kingdom and
426 United States of America. Future studies could endeavour to attract greater
427 representation from other countries.

428 Conclusion

429 This study is the first to report on the assessment practices of a
430 multidisciplinary, international group of clinicians working in brain injury
431 rehabilitation. A number of clinical and research implications have been discussed.
432 However, the outstanding issue is that rehabilitation services need to be matched to the
433 needs, strengths and capacities of each individual and modified as that person's needs
434 evolve. Impairments in social functioning are clearly cited as a need, yet are not
435 currently being addressed adequately by either standardised assessment or evidence-
436 based rehabilitation. The gap between need and practice can be addressed through a
437 collaborative approach of clinicians and researchers in this field. Only then can we be
438 sure that we are bridging the gap between current and best practice in TBI
439 rehabilitation.

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654 Table 1. *Source of respondents*

Source	No. of responses	% of sample
ASSBI	130	34.5
OT Australia	3	0.8
QLD Physiotherapy Network	10	2.7
Email from colleague	187	49.6
Speech Pathology Australia Brain Injury Research Group	4	1.1
Synapse - Brain Injury Network	14	3.7
Special Interest Group in Neuropsychological Rehabilitation	14	3.7
Victorian Brain Injury Recovery Association	1	0.3
Other	14	3.7
Total	337	85.1*

**85% of participants responded to this question.*

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668 Table 2. *Demographic and workplace data*

Sample characteristics			
		<i>N</i> = 443	
		<i>N</i>	(%)
Gender	Female	345	77.9
	Male	98	22.1
Location	Australia	260	58.6
	<i>NSW</i>	82	18.5
	<i>VIC</i>	60	13.5
	<i>WA</i>	44	9.9
	<i>QLD</i>	32	7.2
	<i>SA</i>	28	6.3
	<i>TAS</i>	8	1.8
	<i>ACT</i>	4	0.9
	<i>NT</i>	2	0.5
	Country other than Australia	183	41.3
Role	Psychology	116	26.2
	<i>Clinical Psychology / General</i>	34	7.7
	<i>Clinical Neuropsychology</i>	82	18.5
	Occupational therapy	69	15.6
	Speech pathology	96	21.7
	Physiotherapy	26	5.9
	Social work	10	2.3
	Rehabilitation physician / Medico	60	13.5
	Nursing	8	1.8
	Case Manager / Rehabilitation Coordinator	32	7.2
	Academia	24	5.4
	Other	2	0.5
	Highest qualification attained	PhD	68
Doctorate		74	16.7
Masters		118	26.6
Honours		43	9.7
Bachelor		126	28.4
Diploma		11	2.5
None completed / Still studying	3	0.7	
Length of time	<12 months	38	8.6

working in	1-3 years	71	16
TBI	4-10 years	130	29.3
rehabilitation	>10 years	204	46

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686 Table 3. *Population and workplace setting of respondents*

		Total sample	
		(N = 443)	
		<i>N</i>	(%)
Location	Inpatient	187	42.2
	Outpatient/community	180	40.6
	Private practice	50	11.3
	University/research centres	26	5.9
Clientele	Paediatric (0-17yrs)	51	11.5
	Adult (18-65yrs)	362	81.7
	Older Adult (>65yrs)	30	6.8
Injury Severity*	Mild	267	60.3
	Moderate	364	82.2
	Severe	368	83.1
	Very severe	281	63.4

**Note: Respondents were asked to mark all that apply*

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Table 4. *Prompts to undertake social cognition assessment*

N = 265	
Concerns reported by client:	%
Relationship problems family/friends/partner	28.68
Altered mood	1.13
Poor quality of life	1.51
Concerns reported by others:	
<i>Family report changes in personality / behaviour</i>	31.32
<i>Clinical team and others</i>	
Identified social skills impairment	17.36
Socially inappropriate behaviour	19.25
Socialisation/communication difficulties observed in group setting	16.60
Clinician noticed social skills a barrier to participation/rehab/goal planning	11.70
Social avoidance (isolating self)/less social network	6.79
Clinician noticed lack of insight	2.26
Inconsistency between cognitive and functional assessment	0.38
Referrer requested	1.13
imaging shows damage/mechanism of injury/severity	5.28
Legal and/or funder request	2.64

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704 Table 5. *Frequency of assessment of each social cognition domain*

	Total sample (N = 274-290)				
	Never (0% of clinical time)	Infrequent (<25% of clinical time)	Somewhat frequent (25- 50% of clinical time)	Frequently (51-85% of clinical time)	Routinely (>85% of clinical time)
Area of social cognition					
Identity recognition	31	36.9	13.6	10.8	7.7
Facial affect recognition	24.7	36.9	16.0	12.9	9.4
Theory of Mind	45.2	28.3	15.1	7.9	3.6
Alexithymia	55.1	24.5	10.6	5.8	4.0
Prosody	33.7	27.7	14.7	12.6	11.2
Knowledge of social norms	10.8	25.4	23.7	23.7	16.4
Interoceptive awareness	47.1	22.8	11.2	12.0	6.9
Sarcasm	29.9	27.4	20.8	14.6	7.3
Social problem solving	7.3	17	21.8	27.7	26.3
Social adjustment	10.5	16.4	20.6	24.4	28.2
Empathy	20.7	24.6	22.8	20.4	11.6
Pragmatic language	23.9	19.4	16.9	19.0	20.8
Apathy	19.5	24.7	19.9	19.9	16.0
Social faux pas	29.9	28.9	19.0	14.8	7.4
Body language recognition	27	27	18.9	14.0	13.0
Insight	2.1	5.9	17.6	26.9	47.6
Anger	10.8	16.8	24.1	18.9	29.4
Disinhibition	6	10.5	16.8	25.3	41.4

Note. Not all respondents responded to each of these questions. At least 94% responded to all questions.

The percentages reported above are valid percentage.

