The Bone & Joint Journal
Over 70 years of orthopaedic excellence

Supplementary Material

10.1302/0301-620X.104B6.BJJ-2021-1687.R1

Table i. Descriptive analysis of statements included in the Delphi Survey Round 1.

Statement	BSCOS respondents (n = 116)				
	N (%)			Median	IQR
	1-3	4-6	7-9		
Ponseti technique					
1. Regarding the treatment of Idiopathic clubfoot deformity in babies and children up to walking age, the Ponseti technique should be the first-line treatment.	1 (1)	1 (1)	114 (98)	9	9 to 9
Referral pathways					
2. If antenatal counselling is offered, it should be performed by the practitioners who run the Ponseti clinic.	6 (5)	32 (28)	78 (67)	8	6 to 9
3. Post-natal referral pathways should allow easy access and early referral.	1 (1)	0 (0)	115 (99)	9	8 to 9
4. Ponseti casting for the uncomplicated Idiopathic clubfoot should begin between two and six weeks of age.	1 (1)	20 (17)	95 (82)	8	7 to 9
5. Premature babies should have treatment delayed until they reach birth age.	22 (19)	56 (48)	38 (33)	6	4 to 7
Initial assessment					
6. A full history (including social history and family circumstances) and examination of the child should be done before treatment commences.	3 (3)	11 (9)	102 (88)	9	8 to 9

7. All babies with a clubfoot deformity should receive a screening US hip scan.	12 (10)	25 (22)	79 (68)	8	6 to 9
8. The Pirani scoring system should be used at initial assessment, and at each visit/stage of treatment.	7 (6)	18 (16)	91 (78)	8	7 to 9
9. A positional clubfoot scores 0 on the Pirani score and is fully flexible.	15 (13)	33 (28)	68 (59)	7	5 to 9
10. Other scoring systems may be used in addition to the Pirani score, at the discretion of the treating clinician.	23 (20)	55 (47)	38 (33)	6	4 to 7
11. Practitioners performing the Ponseti technique should be able to recognize an atypical foot, and a neuromuscular/syndromic foot and refer it onwards if it would be more appropriately treated elsewhere.	1 (1)	6 (5)	109 (94)	9	8 to 9
12. Radiographs of the foot are not required.	13 (11)	30 (26)	73 (63)	8	6 to 9
Ponseti clinic set-up					
13. Two trained staff must be present for each casting; the clinic must have enough staff to be able to run a weekly clinic service and support annual leave.	3 (3)	18 (16)	95 (82)	8	7 to 9
14. The lead clinician (doctor, physiotherapist, or nurse) should have undergone specific practical Ponseti training on an official Ponseti training course and have a broad experience of paediatric orthopaedics in addition.	4 (3)	13 (11)	99 (85)	8	7 to 9
15. To maintain competency, a minimum of 10 new structural clubfoot babies should be treated per year; units that treat fewer than this should have clear pathways for onward referral to more experienced practitioners in case of difficulty.	18 (16)	34 (29)	64 (55)	7	5 to 8.25
16. Babies and children should be treated in a separate area from adults.	10 (9)	30 (26)	76 (66)	8	6 to 9

17. Results, including the number of casts required, tenotomy and revision tenotomy rates, should be audited at least annually to ensure maintenance of skills and acceptable results.	4 (3)	21 (18)	91 (78)	8	7 to 9
18. Parent information regarding treatment, cast removal, tenotomy, and boots and bar wear should be made available verbally, with leaflets, and online.	3 (3)	12 (10)	101 (87)	9	7 to 9
19. Every clinic must supply to parents the emergency out of hours contact details of a Ponseti practitioner from the clinic for plaster slips, concerns post-tenotomy, and problems in the initial boot-fitting period.	17 (15)	26 (22)	73 (63)	7	5 to 9
Casting process					
20. The Ponseti method of casting should be strictly adhered to.	2 (2)	10 (9)	104 (90)	9	8 to 9
21. Two trained practitioners are required for every cast.	11 (9)	26 (22)	79 (68)	8	6 to 9
22. A thin layer of padding should be used without stockinette encasing either the foot or the whole leg.	13 (11)	20 (17)	83 (72)	8	6 to 9
23. Plaster of Paris should be used in all cases, quick setting if possible.	5 (4)	12 (10)	99 (85)	8	7 to 9
24. Ponseti casts are above-knee casts, toe to groin.	1 (1)	3 (3)	112 (97)	9	8 to 9
25. A footplate should be left below the toes **and** cut out above the toes.	4 (3)	14 (12)	98 (84)	8	7 to 9
26. Casts should be changed every four to seven days, dependent on the practicalities of clinic set-up.	2 (2)	17 (15)	97 (84)	8	7 to 9
27. Although casts can be soaked at home immediately prior to a casting session, every cast should be removed in the casting clinic and not at home, to allow inspection of quality of the previous cast, and to check for slips and pressure areas.	15 (13)	20 (17)	81 (70)	8	6 to 9

28. If a cast slips, it must be removed immediately (babies must not be left in a cast which has slipped).	3 (3)	12 (10)	101 (87)	9	7 to 9
29. Parents should be taught how to tell if a cast has slipped, how to contact the team out of hours, and told how to remove the cast or where to take the child for it to be removed.	2 (2)	8 (7)	106 (91)	9	8 to 9
30. When necessary, it is possible and practical to apply Ponseti casts to a child who also requires a Pavlik harness.	7 (6)	26 (22)	83 (72)	8	6 to 9
31. The skin condition/presence of pressure sores should be assessed and recorded at every cast change.	1 (1)	12 (10)	103 (89)	9	8 to 9
32. Active movement of the leg and foot (e.g. eversion of the foot, dorsi-flexion of the big toe) should be assessed and recorded at every cast change.	13 (11)	24 (21)	79 (68)	8	6 to 9
33. The occurrence of any of the following in an individual baby should prompt a practitioner to seek help or onward referral: 1) pressure sores, 2) repeated slips, 3) more than six to seven casts, 4) failure to progress, 5) presentation of atypical and non-idiopathic feet if they do not have the experience to treat these feet.	2 (2)	10 (9)	104 (90)	9	8 to 9
Tenotomy					
34. The foot is ready for tenotomy when the talar head is covered, the heel is in neutral or valgus, and the anterior process of the os calcis has come out from under the talus.	2 (2)	14 (12)	100 (86)	8	7 to 9
35. The primary tenotomy should be performed under local anaesthesia, however GA may be considered for children over the age of six months, or at the discretion of the surgeon.	3 (3)	19 (16)	94 (81)	8	7 to 9
36. Currently in the UK, the tenotomy should be performed by a trained	3 (3)	4 (3)	109 (94)	9	8 to 9

surgeon or under the direct supervision of a trained surgeon.					
37. There must be adequate access to a surgeon so that the tenotomy can be performed in a timely fashion, with no long waits in cast for surgeon availability.	1 (1)	2 (2)	113 (97)	9	8 to 9
38. An environment with facilities allowing for paediatric resuscitation should be available; this would classically be in a clinic environment within a hospital or health centre.	3 (3)	12 (10)	101 (87)	9	7 to 9
39. The tenotomy should be a complete tenotomy of the Achilles tendon, performed percutaneously, using as small a blade as possible, using a sterile technique.	2 (2)	3 (3)	111 (96)	9	8 to 9
40. The pre-tenotomy cast should only be removed immediately prior to tenotomy.	5 (4)	29 (25)	82 (71)	8	6 to 9
41. The post-tenotomy cast should stay on for two to three weeks, with an option to change the cast within this timeframe.	3 (3)	11 (9)	102 (88)	9	7 to 9
42. Boots and bars must be available for fitting as soon as the cast is removed - they may need to be measured prior to the tenotomy.	1 (1)	9 (8)	106 (91)	9	8 to 9
43. The tenotomy rate (which must be audited) should be at least 90%.	15 (13)	31 (27)	70 (60)	7	5.75 to 9
FAB					
44. The maintenance of a well-corrected clubfoot relies on good compliance with the FAB, which requires a) education of parents on the importance of bracing starting at the first assessment (or antenatal counselling stage) and reinforced at each consultation, b) regular contact and support for families from the Ponseti practitioner, c) reliable social media sources can also be recommended for information and support.	2 (2)	3 (3)	111 (96)	9	8 to 9

45. The boots used should be attached to a fixed bar, shoulder width apart, with an ability to set the angles to 60° to 70° on the affected side, and 30° to 40° on the unaffected side.	2 (2)	7 (6)	107 (92)	9	8 to 9
46. The FAB should be worn for 23 hours a day for the first three months then at night-time and naps until five years of age (at least 10 to 12 hours per day in this second phase) and parents should be informed of this at the start of treatment.	3 (3)	13 (11)	100 (86)	9	8 to 9
47. There is not yet evidence to support the use of unilateral braces or articulated braces.	5 (4)	33 (28)	78 (67)	8	6 to 9
48. The FAB should be fitted, and regular follow-up should be performed, by a trained and experienced Ponseti practitioner.	4 (3)	10 (9)	102 (88)	9	8 to 9
49. At the first fitting the Ponseti practitioner should fit the FAB, teach and then watch parents fitting the boots.	4 (3)	9 (8)	103 (89)	9	8 to 9
50. The baby should be settled before sending home; parents should be advised that initial unsettled nights are to be expected.	3 (3)	17 (15)	96 (83)	8.5	7 to 9
51. There should be regular follow up. An example of such a plan could be: one week after the FAB first fitted, three-monthly until two years, and then six-monthly until five years.	1 (1)	19 (16)	96 (83)	8	7 to 9
52. After discontinuing FAB wear, follow up should be for at least three to five years or up to skeletal maturity.	7 (6)	21 (18)	88 (76)	8	7 to 9
53. If skin issues are encountered during FAB wear, we recommend some or all of the following: 1) using long close-fitting socks, 2) trying another make of boot, 3) a period of recasting.	5 (4)	18 (16)	93 (80)	8	7 to 9

54. At each review appointment the following should be checked: 1) correction of the foot e.g. palpate the heel, 2) skin condition, 3) Pirani Score.	4 (3)	21 (18)	91 (78)	8	7 to 9
55. There should be easy access to a variety of boot sizes, with a good selection of stock or pre-ordered sizes, to ensure that no baby is ever left out of FAB.	2 (2)	12 (10)	102 (88)	8.5	7 to 9
Relapse					
56. Relapse implies a reappearance of any of the elements of the clubfoot deformity in a foot that has previously fitted easily into the FAB.	2 (2)	20 (17)	94 (81)	8	7 to 9
57. If a foot has never settled in the FAB, a reassessment of the adequacy of deformity correction should be made.	1 (1)	4 (3)	111 (96)	9	8 to 9
58. Early relapse in pre-walkers should be treated with recasting in an above-knee cast, following careful assessment of which components have relapsed.	1 (1)	7 (6)	108 (93)	9	8 to 9
59. If a revision tenotomy is required, strong consideration should be given to performing this under GA.	4 (3)	15 (13)	97 (84)	9	7 to 9
60. There should be at least eight weeks in-between a primary and a revision tenotomy.	13 (11)	27 (23)	76 (66)	7	5 to 9
61. FAB should be re-introduced when the foot is corrected (sometimes an alternative boot and bar system may help regain trust and compliance, enabling reintroduction of a bracing regime, with a view to going back to the fixed bar as soon as possible).	7 (6)	10 (9)	99 (85)	8	7 to 9

FAB, foot abduction brace; GA, general anaesthesia; IQR, interquartile range; US, ultrasound.

Table ii. Descriptive analysis of statements included in the Delphi Survey Round 2.

Statement	BSCOS respondents (n = 102)				
	N (%)			Median	IQR
	1-3	4-6	7-9		
Referral pathways					
1. If antenatal counselling is offered it should be performed by the practitioners who run the Ponseti clinic.	4 (4)	21 (21)	77 (75)	8	7 to 9
2. Premature babies can have treatment delayed until they reach birth age, bearing in mind foot size and the size of the smallest available boot.	6 (6)	35 (34)	61 (60)	7	5 to 8
Initial assessment					
3. All babies with a clubfoot deformity should receive a screening US hip scan.	11 (11)	12 (12)	79 (77)	8	7 to 9
4. Radiographs of the foot are not usually required in the initial management of the idiopathic clubfoot.	12 (12)	3 (3)	87 (85)	9	7.25 to 9
Ponseti clinic set-up					
5. All Ponseti clinics should have a named Consultant overseeing the clinic (either on site or visiting).	5 (5)	12 (12)	85 (83)	9	8 to 9
6. To ensure competency, all clubfoot clinics should be run by properly trained personnel, regularly audited, exist in networks providing regional support and with clear pathways for onward referral to more experienced practitioners in case of difficulty.	0 (0)	10 (10)	92 (90)	8	7 to 9
7. In line with the CQC inspection framework, ideally, babies and children should be treated in a child appropriate environment, separately from adults.	8 (8)	13 (13)	81 (79)	8	7 to 9
8. Parents should have clear out of hours contact information for emergency advice, with robust pathways for out of hours clinical care, to address, for example, concerns post-tenotomy, plaster slips, including cast removal if necessary.	5 (5)	7 (7)	90 (88)	8.5	7.25 to 9

Casting process					
9. Two Ponseti-trained practitioners are required for every cast.	14 (14)	17 (17)	71 (70)	8	6 to 9
10. A single thin layer of padding without stockinette should be used under the cast.	9 (9)	10 (10)	83 (81)	8	7 to 9
11. Casts should be removed immediately prior to a casting session, ideally in the clinic and not at home, to allow inspection of quality of the previous cast, and to check for slips and pressure areas.	9 (9)	15 (15)	78 (76)	8	7 to 9
12. When necessary, it is possible and practical to apply Ponseti casts to a child who also requires a Pavlik harness.	3 (3)	12 (12)	87 (85)	8	7 to 9
13. Active movement of the leg and foot (e.g. eversion of the foot, dorsiflexion of the big toe) should be assessed and recorded.	10 (10)	20 (20)	72 (71)	7	6 to 8.75
Tenotomy					
14. It should be expected that a tenotomy will be required - in most settings this will be in 85 to 95% of patients.	0 (0)	9 (9)	93 (91)	8	8 to 9
FAB					
15. There is not yet evidence to support the use of unilateral braces.	4 (4)	14 (14)	84 (82)	8	7 to 9

CQC, Care Quality Commission; FAB, foot abduction brace; IQR, interquartile range; US, ultrasound.