



New Zealand ACL Registry
Annual Report 2017



New Zealand ACL Registry Annual Report 2017

Acknowledgements:

The New Zealand ACL Registry Trust would like to thank the Accident Compensation Corporation for its funding assistance. We also receive funding from our industry partners: DePuy, Device Technologies and Smith & Nephew. We are also grateful for the participation of New Zealand Orthopaedic Surgeons for participating in the Registry, both through financial contributions and enrolling their patients.

ACL Registry Trust Structure:

The ACL Registry Trust has been registered as a charitable Trust under New Zealand law. The Trustees are Hamish Love, Orthopaedic Surgeon, Christchurch, Mark Clatworthy, Orthopaedic Surgeon, Auckland and David Barker, Accountant, Christchurch.

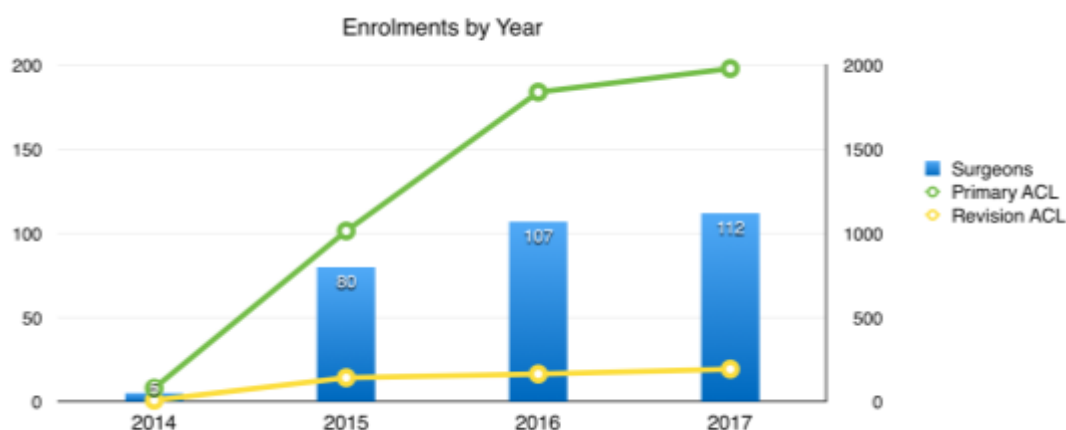
The Registry has a permanent database Administrator, Charlotte Smith and employs a part-time data entry assistant.

The Registry has moved to Forte Sports, Forte 2, 132 Peterborough Street as a permanent home.

Introduction:

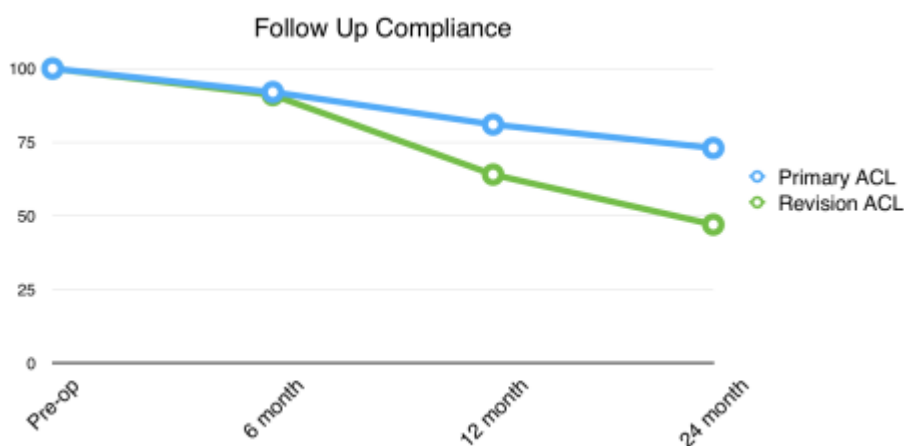
The New Zealand ACL Registry is now in its fourth year of operation. We are progressing towards our goal of capturing all ACL procedures done in New Zealand. The number of Surgeons and Hospitals involved in the Registry has been steadily growing over the last 12 months. In September 2015, there were 68 participating Surgeons, now this number is 115. For the 12 months until August 2017 enrolled 2172 patients in the Registry. The numbers through the year continued to grow, and we estimate we are now enrolling around 70% of the estimated 3000 ACL reconstructions performed in New Zealand each year.

The NZOA Executive has now made participation in NZOA approved registries mandatory. All surgeons who perform ACL reconstruction must actively participate in the ACL registry to fulfil their CME requirements. We expect this change will increase our capture rate to over 85% of all reconstructions.



Data set integrity:

The Registry continues to work hard on maintaining a complete data set. The majority of individuals requiring ACL reconstruction are young. This group are mobile and often hard to keep a track of. As a consequence, the well-established Registries manage only around 50% follow up at the two-year mark, dropping off to less than 40% at the five-year mark. Currently we are achieving 70% follow up at the two year mark for our primary ACLs and better than that at all preceding time points.



Further measures are being instituted to improve follow up compliance. These include SMS text reminders linking to the outcome questionnaires, giving improving web based access to Registry information and forms.

The Registry Trust has developed a stand-alone ACL Registry website. The site contains patient information regarding ACL injuries and the ACL Registry. Research generated by the registry and annual reports will be available on-line. Additionally, it provides a link for patients to contact the Registry if required.



Surgeon resources on the website:

- Enter complications directly on-line while in clinic. This feature will increase the ease of reporting on post-op complications or graft ruptures. Accurate collection of this data is critical for the validity of the registry
- Downloadable registry forms. Hospital or clinic staff can print out registry enrolment forms .

Future directions:

International collaboration:

The New Zealand ACL Registry Clinical Advisors remain in regular contact with other Registries around the world. They are working towards international collaboration on major research projects and developing structural arrangements to ensure compatibility between the data sets we collect.

Upcoming research projects:

The New Zealand ACL Registry is pleased to be involved with providing data that leads to quality research in ACL injuries and their treatment. At the of the report this was 3748 patients who were 6 months post-operative, 2109 who were 1 year post-operative and 1130 that were 2 years post-operative.

The data set is now reaching numbers where meaningful research can be completed.

Current projects include:

- The effect of delaying ACL reconstruction on rates of chondral and meniscal damage. Hamish Love
- A retrospective analysis looking at the impact of peripheral nerve blockage on intermediate term (six to twelve month) quadriceps function after ACL reconstruction. Matthew Boyle.
- An RCT comparing hamstring and quadriceps tendon grafts. Currently in the final stages of preparation for ethics submission. Mike Van Niekerk
- Revision ACL Reconstruction – Do patients see a different surgeon. Simon Young

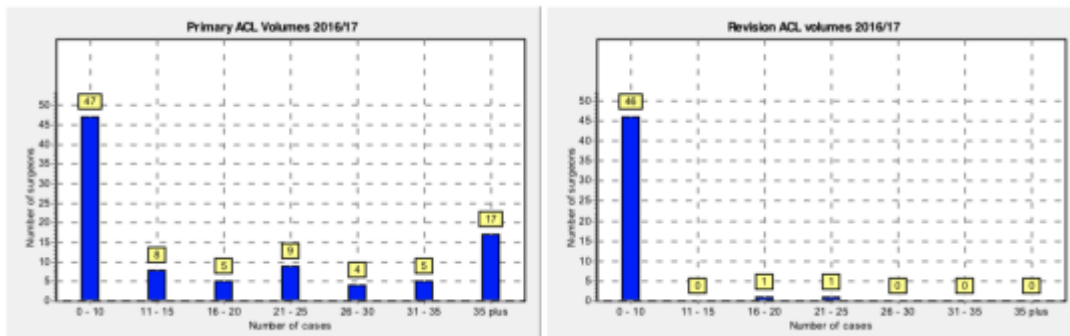
Results:

As of 1st September 2017, 5411 patients have been enrolled in the ACL registry. 4912 primary and 499 revision ACL reconstructions were recorded.

Case volume by hospital:

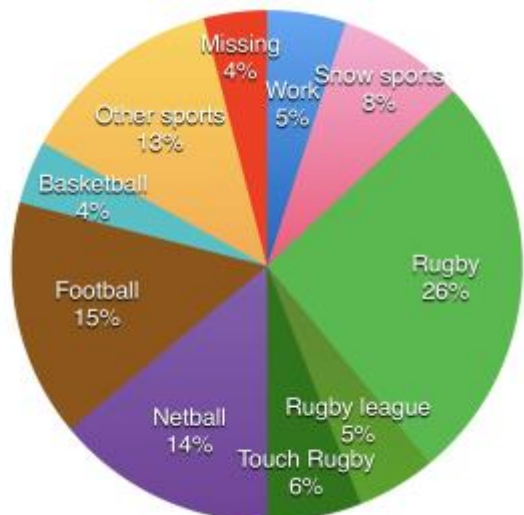
Hospital	Number	Percent
SX Christchurch	404	7.4
St Georges	350	6.5
Royston	91	1.7
Manuka Street	183	3.4
Wakefield	184	3.4
Mercy Dunedin	132	2.4
Selina Sutherland	13	0.2
Bowen Hospital	145	2.6
SX New Plymouth	122	2.2
SX Wellington	214	3.9
SX North Harbour	286	5.2
Southland Invercargill	8	0.1
SX, Invercargill	156	2.6
SX, Hamilton	221	4
Belverdale	58	1
Mercy/Ascot	1032	19
SX, Rotorua	57	1
SX, Brightside	51	1
Crest	3	0.1
Grace	113	2.2
Forte	399	7.3
Auckland Surgical Centre	848	15.4
Anglesea	31	15.4
Churchill	53	1
Chelsea	22	0.1
Bidwell	79	1.4
Braemar	144	2.6
Kensington	21	0.1
SX Napier	1	0.1
Starship	1	0.1
Masterton	7	0.1
Nelson Hospital	1	0.1
Southland	8	0.1

Case volume by surgeon:



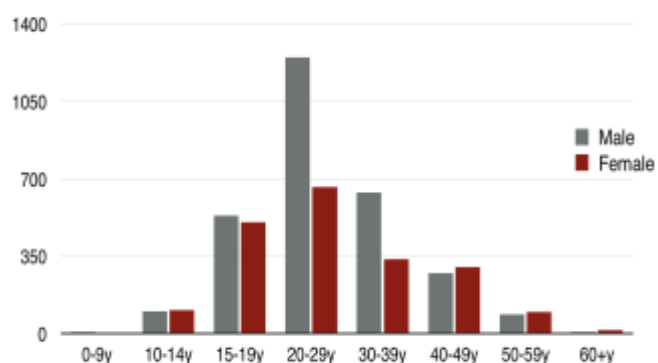
Mechanism of Injury:

Rugby, in its various forms, remains the most common mechanism of injury (36% of patients), with football (15%), netball (14%) and snow sports (9%) being the other common codes.

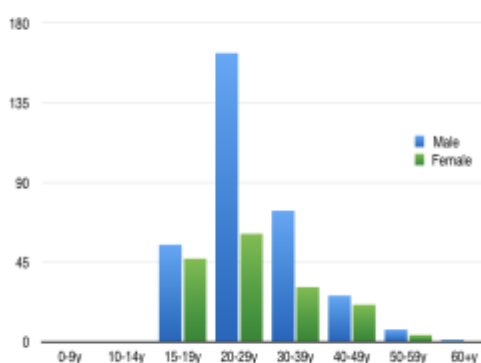


Demographics:

	Primary ACL Reconstruction	Revision ACL reconstruction
Male: female	2895:2017 (59% male)	329:170 (66% male)
Average age at surgery	28.2y (8-68y)	27.7y (13.1-63.6y)
Delay to surgery	10.1 months	19.6 months



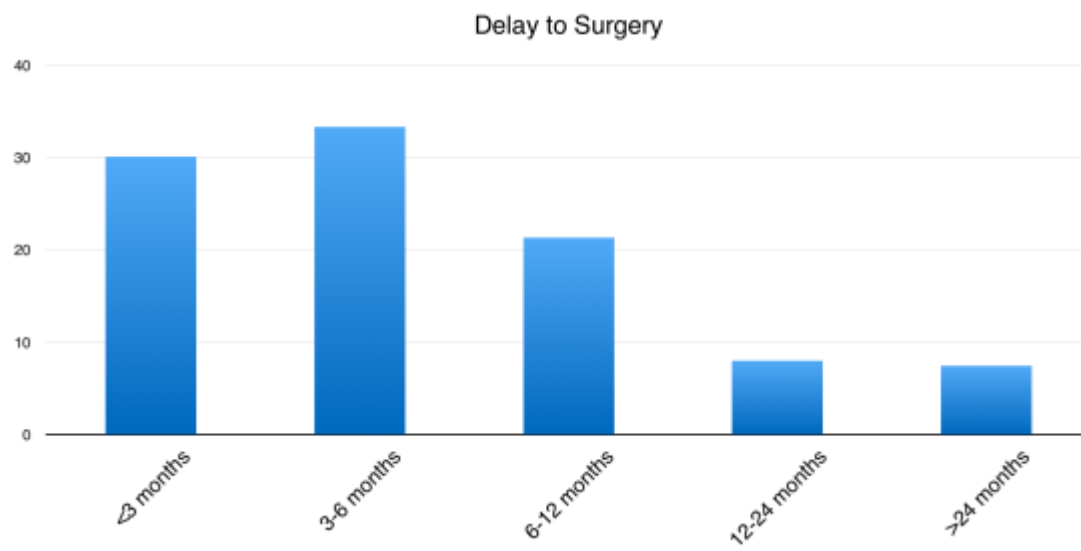
Age distribution: Primary



Age distribution: Revision

Delay to Surgery:

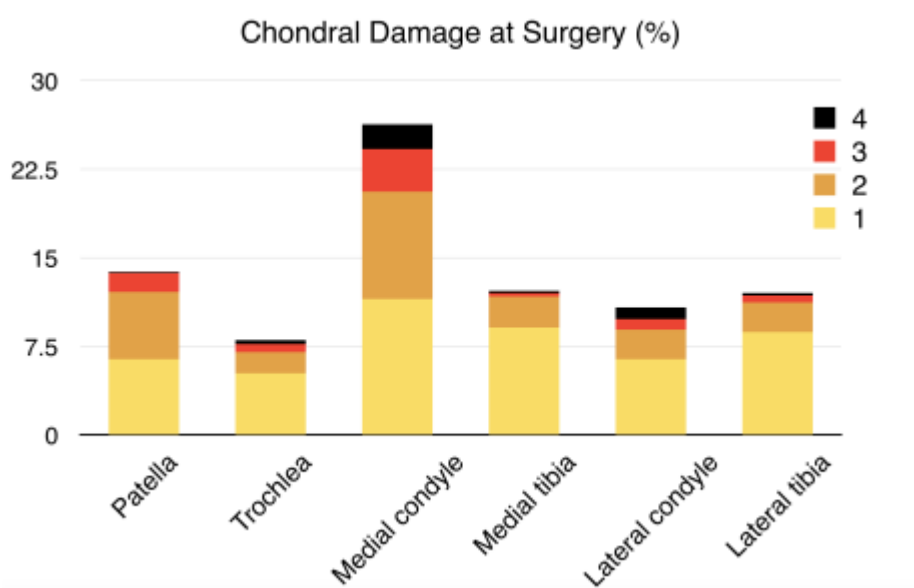
The majority of patients receive a primary ACL reconstruction within 6 months of injury. Median time is around 5 months. The long tail on the curve pushes the average time out to 10.1 months.



Chondral injury:

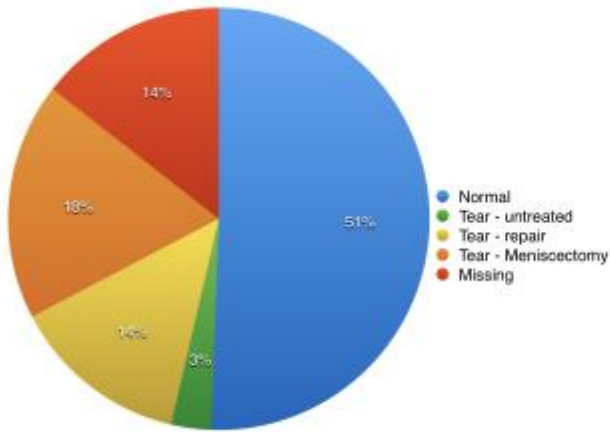
Chondral injuries were common at the time of surgery, the most frequently and severely affected area was the medial femoral condyle, being damaged in 29.6% of cases, it was also the area most frequently associated with higher grade chondral injuries (ICRS grade 3 and 4).

The majority of the injuries were not treated (69%). Chondroplasty was completed in 5.9% and microfracture in 2.9%. The chondral treatment field was not completed in 14.8% of operative data forms.

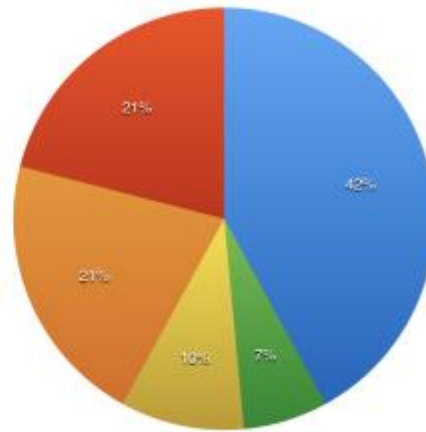


Meniscal injury:

About 1/3 of menisci have significant tears requiring treatment at the time of ACL reconstruction (31% medial, 29% lateral). The meniscus are more frequently found to be reparable on the medial side than lateral (36% vs 26%). Implants are used twice as frequently as the more traditional sutures techniques on both sides of the knee.



Medial meniscus

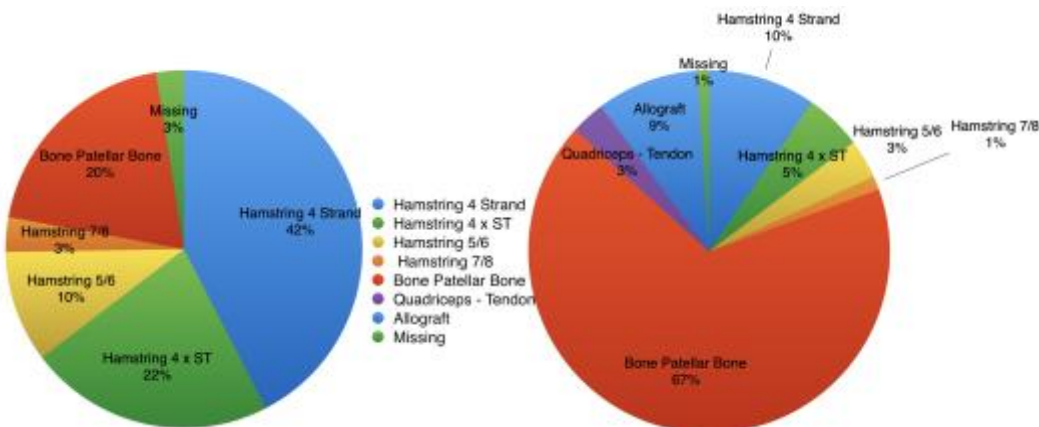


Lateral meniscus

Graft Choice:

For primary ACL reconstruction, the predominant graft choice is hamstring, accounting for 77% of all primary ACLs. 42% are 4 strand grafts with semitendinosus and gracilis. The majority of the others are quadrupled semitendinosus grafts (22%), although there is a trend for an increasing use of 6 to 8 strand grafts (13.1%). BTB is the next most popular graft, making up 19.4% of primary ACLs.

These numbers reflect a change in graft choice. There has been an increase in the use of BTB grafts by 26% (14% up to 19.4%)

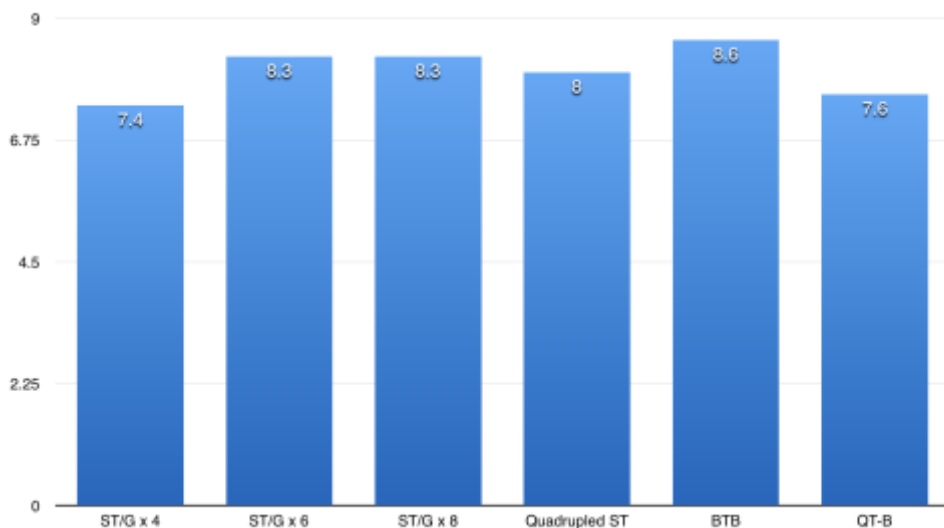


Graft choice: Primary

Graft choice: Revision

Graft diameter by graft choice:

At this point, there has been a decrease in all graft sizes compared with 2016. The graft decrease is by up to 12 mm per graft type with the largest decrease being BTB with a difference of 11mm and QT 12mm.

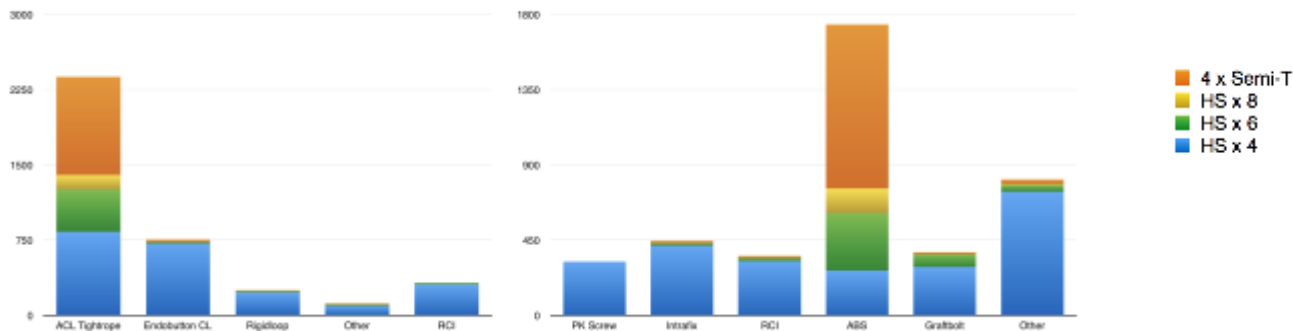


Tunnel drilling technique:

Tibial tunnel drilling data indicates that all are completed with antegrade drilling techniques. However, the operative data form was not completed in 13.3% of cases. 5 physal sparing cases were recorded.

Femoral tunnel drilling was via an anteromedial portal in 72% of cases, transtibial in 13.2% and outside-in with a Flipcutter technique in 1.4% of cases. Data was missing in 12% of cases.

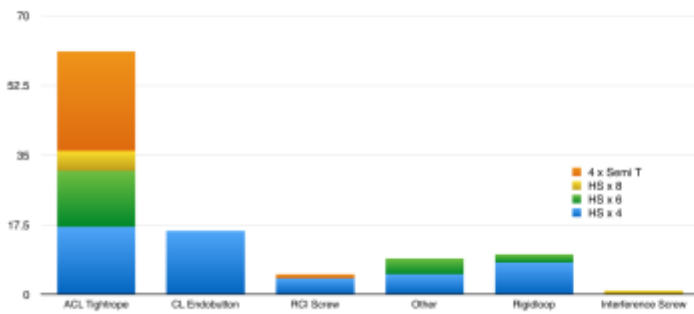
Graft fixation technique: Hamstring Primary Patients



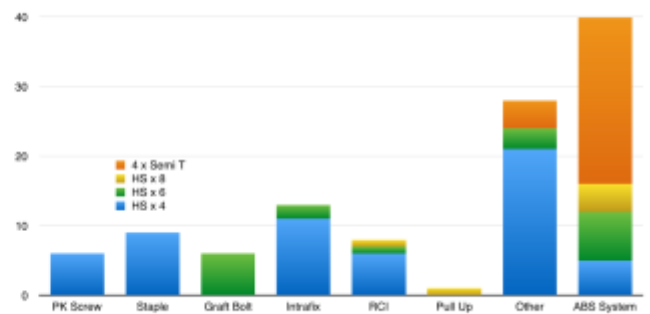
Femoral fixation

Tibial fixation

Graft fixation: Hamstring Revision Patients

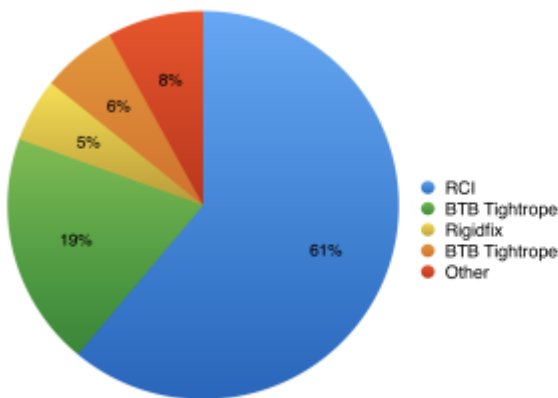


Femoral fixation

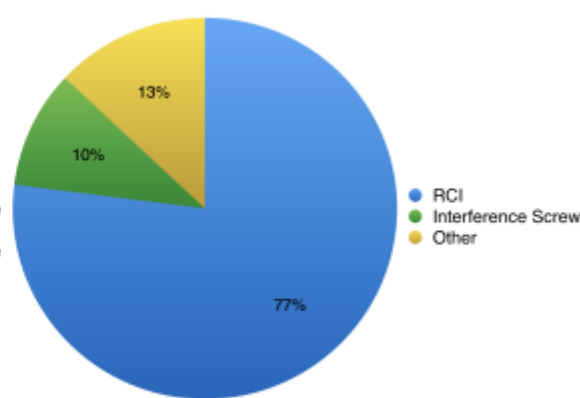


Tibial fixation

Graft fixation: Patellar tendon Primary Patients

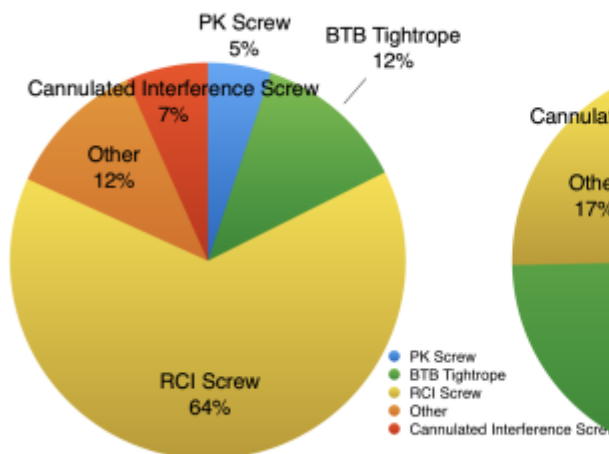


Femoral fixation

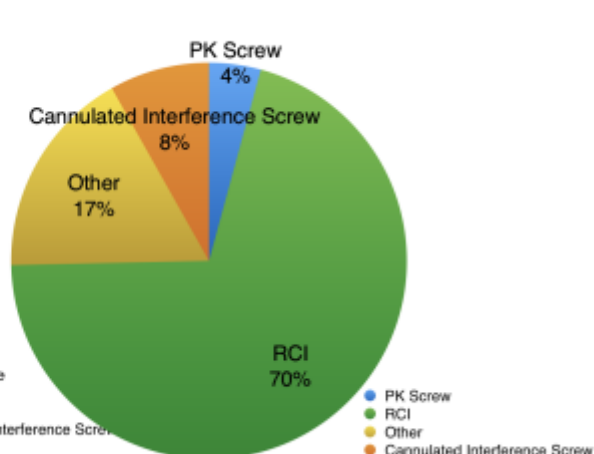


Tibial fixation

Graft fixation: Patellar tendon Revision Patients



Femoral Fixation



Tibial Fixation

Antibiotic use:

Cephazolin	79%
Cefuroxime	1%
Augmentin	3%
None recorded	17%

Thromboprophylaxis:

None	80%
Aspirin	6.2%
Combination	5.7%
TEDs	2.6%
Footpumps/SCDs	4%
Clexane	1.5%

Complications:

These are broken down into intra-operative complications, post-operative complications and re-ruptures. Complications are captured in 3 ways. Firstly, treating surgeons enter operative complication on the operative data form. Secondly, post-op complications are recorded on the complications form and returned to the registry. Finally, patients completing follow up questionnaires are asked if they have had any complications relating to their ACL surgery or further injuries to their knee.

	Primary ACL (n)	Revision ACL (n)
<i>Intraoperative complication</i>		
Implant failure	51	1
Harvest failure / tendon damage	44	1
Equipment problem or failure	14	4
Fixation / tunnel complications	11	5
<i>Post-operative complication*</i>		
Infection	9	-
DVT	11	-
Arthrofibrosis	32	4
Implant-irritation/removal	9	3
Other hospital admission	7	6
Meniscal tear	26	3
Donor site problem – hamstring**	48	1
Donor site problem – patella**	20	3
<i>Recurrent instability</i>		
Atraumatic	13	3
Traumatic	62	2
Other / not recorded	27	11
<i>Patients with recurrent instability requiring revision ACL reconstruction:</i>	83	9

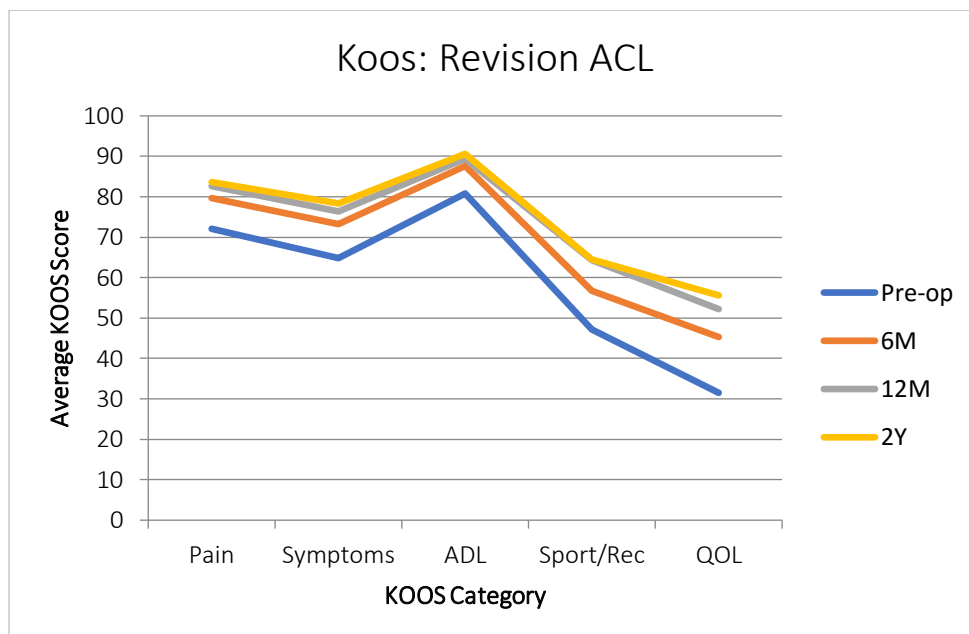
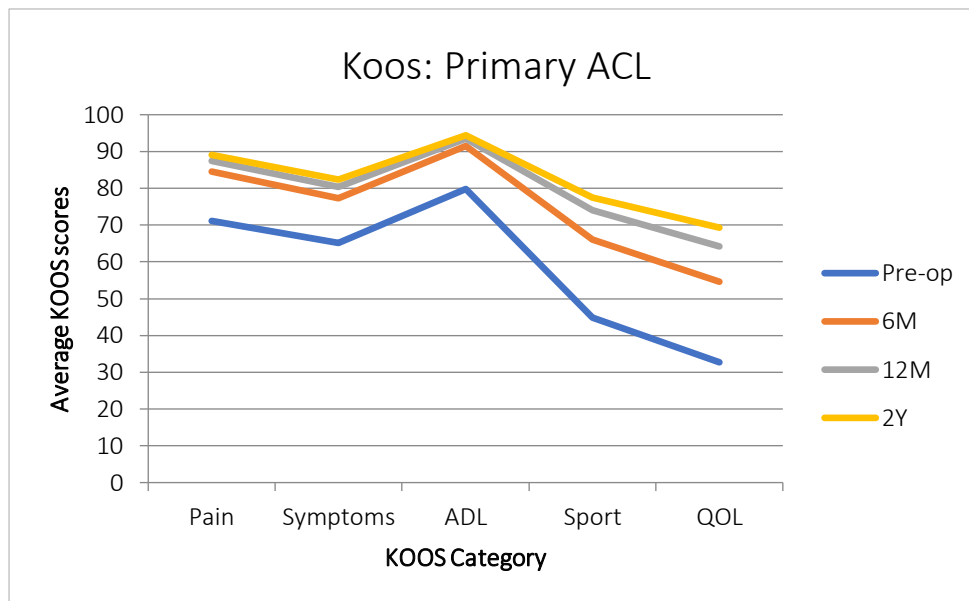
* Complications are recorded if they are significant to require hospital readmission or reoperation.

**The exception to this is donor site problems. These are listed if the patient reports significant symptoms related to the graft harvest site.

Outcome scores:

The KOOS score is a validated outcome questionnaire for ACL injuries and surgery. A 5 point scale from 0: none, to 4: Extreme, is completed for each of the subscales. These include:

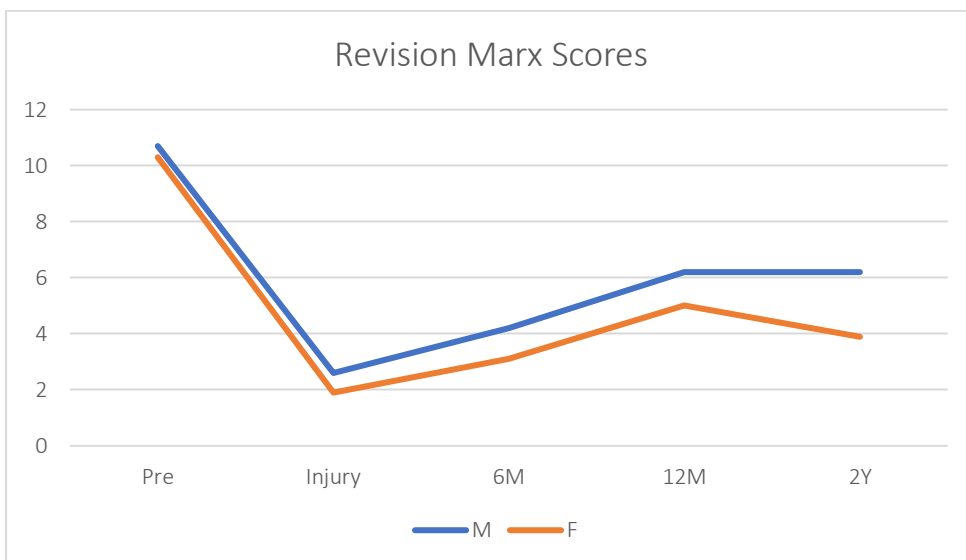
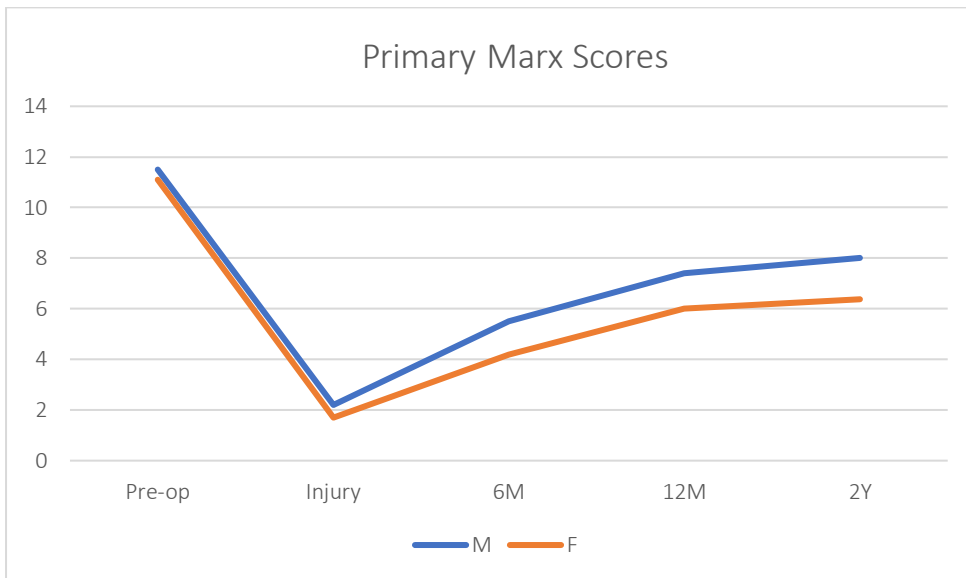
- Pain: amount of pain in the last week
- Symptoms: Knee injury symptoms in the last week e.g. swelling, grinding, ability to straighten knee.
- ADL: Functional problems with activities of daily living, e.g. descending stairs
- Sport/Recreation: The degree of difficulty in physical tasks performed in the last week e.g. squatting pivoting etc.
- Quality of Life: Awareness of knee problems and confidence in the knee.



The scores in our cohort over time are very similar to those presented in other registry data. KOOS scores show improvement over all time points in primary ACL reconstruction. Revision KOOS scores show less improvement overall, in spite of a similar starting point.

Marx Scores:

The Marx score is a measurement of how often the individual engages in ACL-dependent physical activities including running, cutting, decelerating and pivoting. The Marx scores show a poorer return to activity after revision surgery when compared with primary ACL reconstruction.



Conclusions:

The Registry is producing a high quality and robust data set. This will enable us to generate meaningful information on patient outcomes and research into the variables of ACL injury and reconstruction. Our primary goal is to improve the quality of patient care in the management of ACL injuries.

The Trustees of the ACL Registry wish to express their gratitude to all participating Surgeons and to the New Zealand Orthopaedic Association, in particular its Knee Society, for making the ACL Registry possible.