GORE ASSURED CLINICAL STUDY

Protocol and study results

Consult Instructions for Use

Together, improving life

Gore ASSURED Clinical Study 6-month data highlights

100% closure success rate at 6 months*,1

GORE® CARDIOFORM ASD Occluder

- High technical success rate — 96%**,1
- Low rate of 30-day serious adverse events (SAEs) — 4.8%1
- Low rate of clinically significant new arrhythmia — 4.8%†,1
- Low rate of device events — 2.4%‡,1

* Defined as a clinical residual defect status of occluded or clinically insignificant as determined by the Echo Core Lab at the 6-month evaluation among subjects with technical success.
** Successful deployment and retention (at conclusion of index procedure) of a GORE® CARDIOFORM ASD Occluder.
† In subjects without prior history of arrhythmia, any new arrhythmia (documented on ECG) requiring hospitalization, initiation of new long-term medical therapy (persisting > 45 days), or any post-index procedure cardioversion or intervention (pacemaker, ablation, etc.).
‡ Defined as post-procedure embolization, device removal, or other device reintervention from completion of the implant procedure through 6 months (180 days) post-procedure.

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Study overview

Study objective:

- Demonstrate that percutaneous closure of *ostium secundum* atrial septal defects (ASDs) with the GORE® CARDIOFORM ASD Occluder is safe and effective

Study design:

- Prospective, multicenter, single-arm comparison to performance goals* derived from clinical study outcomes for devices indicated for ASD closure

Site requirements:

- Two training cases were required at each site prior to enrolling pivotal subjects

125
Patients enrolled

- No age limitations
- Ostium secundum ASDs measuring 8–35 mm by stop-flow balloon sizing
- No retro-aortic rim requirements
- Attempted GORE® CARDIOFORM ASD Occluder implantation
- Three year follow-up
- 22 sites in the U.S.

* Performance goals derived from clinical study outcomes for devices indicated for ASD closure.

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- Anatomically adaptable waist fills and conforms to the defect for ASDs from 8 to 35 mm [2]
- Soft and conformable construction designed to integrate with the natural structure of the atrial septum
- Device design and material properties combine to optimize septal conformability and tissue ingrowth for short and long-term performance

GORE® CARDIOFORM ASD Occluder

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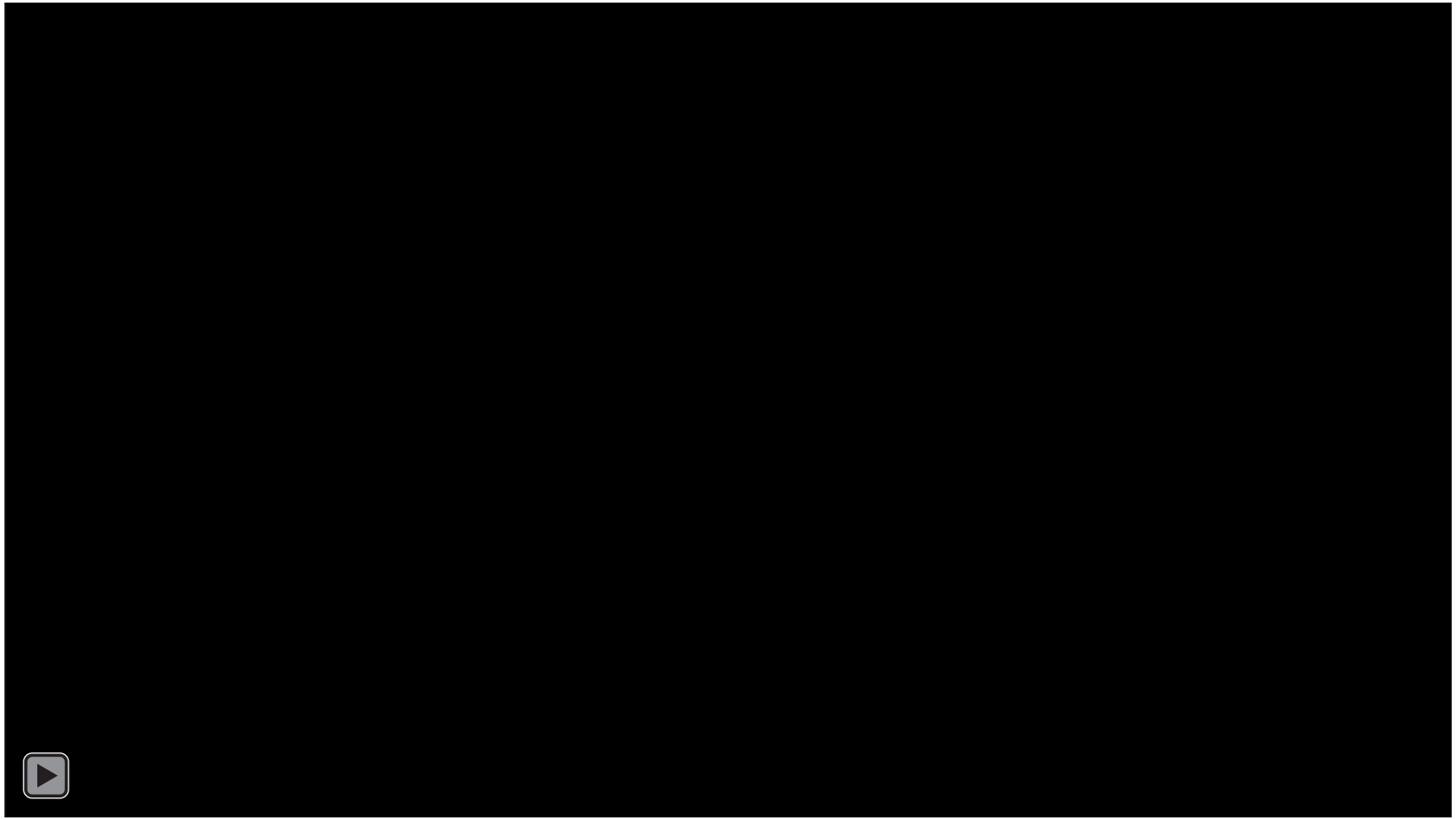

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Inclusion / Exclusion criteria

Inclusion

- Age: Any
- Ostium secundum ASDs measuring 8–35 mm by stop-flow balloon sizing
- Inter-atrial shunting with evidence of right heart volume overload
- Subject is judged by the implanting physician to have adequate septal rims to retain the study device
- Vasculature to accommodate procedural accessories
- Subject anatomy: Accommodation for transesophageal echocardiography (TEE) and intra-cardiac echocardiography (ICE) during procedure

Exclusion

- Patient has no significant known pre-existing electrophysiologic or structural cardiovascular defects that would require surgical treatment within 3 years of device placement
- Patient has systemic or inherited conditions that would increase the risk of morbidity or mortality during the term of the study
- Subject anatomy will inhibit device placement or could be interfered with by occluder size or position
- Active cardiac / general infections, thrombi, pulmonary vascular resistance, uncontrolled arrhythmias
- Pregnancy / lactation
- History of stroke with significant morbidity / disability
- Contraindication to antiplatelet or anticoagulant meds
- Multiple defects requiring more than one device
- Subject awaiting procedure requiring trans-septal atrial access within 6 months of procedure

Primary endpoints

Co-primary endpoint one:

- *6-month closure success* is defined as a clinical residual defect status of occluded or clinically insignificant as determined by the Echo Core Lab at the 6-month evaluation among subjects with technical success

Co-primary endpoint two:

- *Composite clinical success* is evaluated at 6-months among subjects with attempted study device closure and is defined as satisfying all of the following criteria:
  - Technical success*
  - Safety success**
  - Closure success†

* Successful deployment and retention (at conclusion of index procedure) of a GORE® CARDIOFORM ASD Occluder.

** Freedom from any Serious Adverse Event (SAE) related to the device or procedure (as adjudicated by the Independent Data Review Board (IDRB)) through 30 days post-procedure and freedom from device events (post-procedure embolization, device removal, or other device reintervention) from completion of the implant procedure through 6 months (180 days) post-procedure.

† Defined as a clinical residual defect status of occluded or clinically insignificant as determined by the Echo Core Lab at the 6-month evaluation among subjects with technical success.

Secondary endpoints

Secondary endpoints:

- Technical success*
- Procedure success**
- Long-term composite clinical success†
- Long-term closure success‡
- Safety outcomes§
- Clinically significant new arrhythmia[II]

GORE® CARDIOFORM ASD Occluder

* Successful deployment and retention (at conclusion of index procedure) of a GORE® CARDIOFORM ASD Occluder.
** Technical success and measured residual defect status of occluded, small (> 0 to ≤ 3 mm residual shunt), or moderate (> 3 to ≤ 6 mm residual shunt) of the target ASD at conclusion of the index procedure.
† Composite clinical success evaluated at 12 months and 36 months.
‡ Closure success evaluated at 12 months and 36 months.
§ The proportion of subjects experiencing one or more SAEs within 30 days post-index procedure or a device event (embolization, device removal, reintervention after completion of index procedure) through 6 months, 12 months, and 36 months post index procedure.
II In subjects without prior history of arrhythmia, any new arrhythmia (documented on ECG) requiring hospitalization, initiation of new long-term medical therapy (persisting > 45 days), or any post-index procedure cardioversion or intervention (pacemaker, ablation, etc.).

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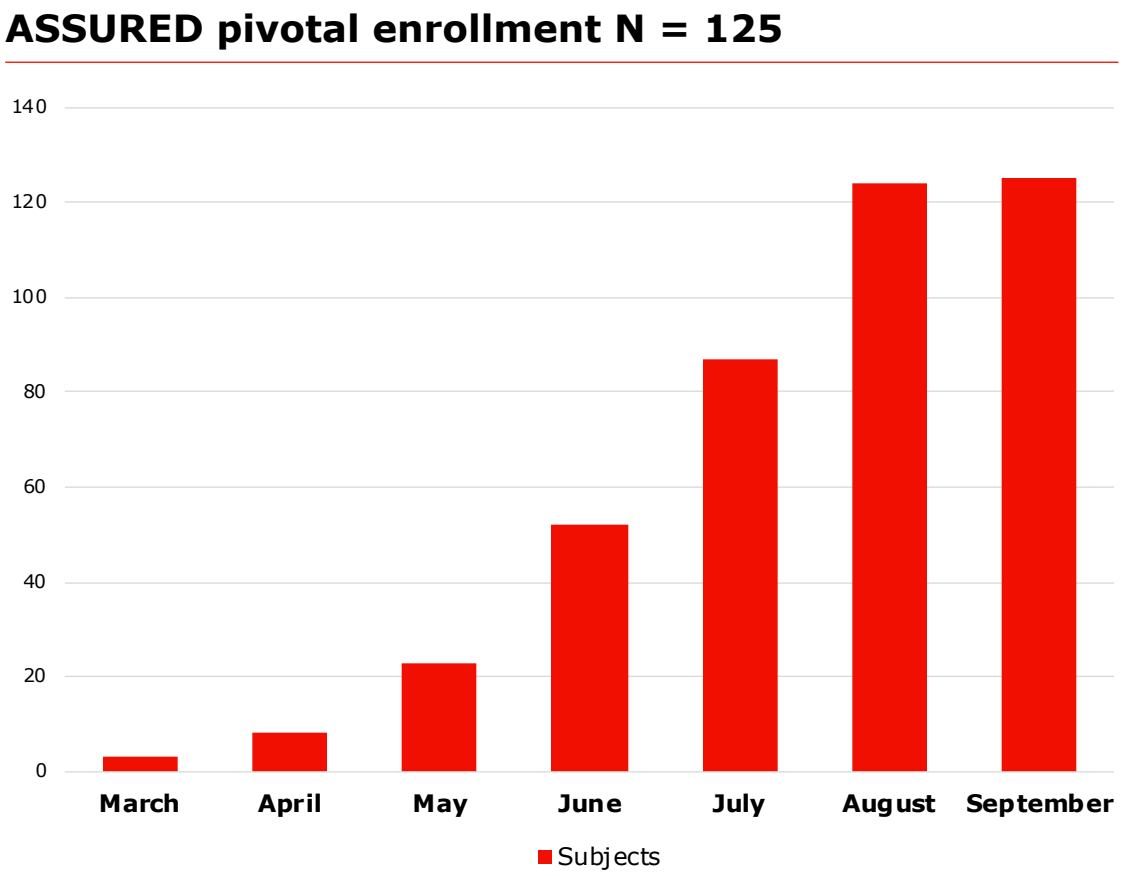
Logistics and timeline

- Enrollment: First training and pivotal subject enrolled: March 2017
  - Pivotal phase enrolled all 125 subjects in 7 months
  - Continued access phase: December 2017
- Last pivotal subject completed 6-month evaluation: May 2018
  - Continued access phase: Ongoing (Up to 535 additional subjects)
- Data lock and analysis: July 2018
- Public presentation at Pediatric and Adult Interventional Cardiac Symposium (PICS): September 2018
- FDA submission: November 2018
- FDA approval: May 28, 2019



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Baseline characteristics

All pivotal subjects enrolled (N = 125)	Mean (min, max) or n (%)
Age at procedure (years)	19.4 (2.9, 84.7)
< 18 years	90 (72%)
≥ 18 years	35 (28%)
Male	39 (31%)
Female	86 (69%)
Height (cm)	139.3 (85.0, 191.0)
Weight (kg)	45.1 (12.0, 105.2)
ASD size (mm)*	14.5 (5.6, 36.0)

* ASD sizing at screening by TEE or TTE.

Procedural defect characteristics

All pivotal subjects enrolled (N = 125)	Mean (min, max) or n / N (%)
Stop flow defect size (mm)	17.3 (8.0, 30.0)
Aortic rim length (mm)	5.1 (0.0, 27.0)
Septal length (mm)	40.0 (21.0, 65.0)
Multiple fenestrations / defects	18 / 125 (14.4%)
Atrial septal aneurysm	6 / 125 (4.8%)

No retro-aortic rim requirements.

Procedure characteristics

Device sizing

Study device size implanted	N = 120
27 mm	22 (18%)
32 mm	43 (36%)
37 mm	26 (22%)
44 mm	24 (20%)
48 mm	5 (4%)

Primary endpoint results

Closure rates

- Co-primary endpoint one:
  - Out of 125 enrolled subjects, 112 completed the required assessments for closure success
  - 100% closure success (112 / 112) regardless of retro-aortic rim deficiencies*,**,1
- Co-primary endpoint two:
  - Composite clinical success as defined by satisfying achievement of technical success†, safety success‡, and closure success was 90%*,1

100% closure success rate at 6 months (112 / 112)*,1

90% composite clinical success at 6 months (108 / 120)1

* Defined as a clinical residual defect status of occluded or clinically insignificant as determined by the Echo Core Lab at the 6-month evaluation among subjects with technical success.
** Deficiency defined as a retro-aortic rim < 5 mm.
† Successful deployment and retention (at conclusion of index procedure) of a GORE® CARDIOFORM ASD Occluder.
‡ Freedom from any Serious Adverse Event (SAE) related to the device or procedure (as adjudicated by the Independent Data Review Board (IDRB)) through 30 days post-procedure and freedom from device events (post-procedure embolization, device removal, or other device reintervention) from completion of the implant procedure through 6 months (180 days) post-procedure.

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Secondary endpoint results

Technical and procedure

- High technical and procedure success*,**,[1]

All pivotal subjects enrolled	(N = 125)
Technical success*,[1]	96% (120 / 125)
Procedure success**,[1]	96% (120 / 125)

* Successful deployment and retention (at conclusion of index procedure) of a GORE® CARDIOFORM ASD Occluder.
** Technical success and measured residual defect status of occluded, small, or moderate of the target ASD at conclusion of the index procedure.

Secondary endpoint results

Safety

- Low rate of 30-day SAEs[1]
- Low rate of device events through 6 months[*,1]
- Low rate of clinically significant new arrhythmia[**,1]

Safety outcomes	
30-day device / procedure-related SAE[1]	4.8% (6 / 125)
6-month device event[1]	2.4% (3 / 125)
Clinically significant new arrhythmia[*,1]	4.8% (6 / 125)

* Defined as post-procedure embolization, device removal, or other device reintervention from completion of the implant procedure through 6 months (180 days) post-procedure.
** In subjects without prior history of arrhythmia, any new arrhythmia (documented on ECG) requiring hospitalization, initiation of new long-term medical therapy (persisting > 45 days), or any post-index procedure cardioversion or intervention (pacemaker, ablation, etc.).

Secondary endpoint results

30-day SAEs

- Low rate of 30-day SAEs[1]

All pivotal subjects enrolled (N = 125)	30-day SAE
Subjects with one or more adverse events	6 (4.8%)
Supraventricular tachycardia	1 (0.8%)
Cerebrovascular accident	1 (0.8%)
Device embolization	1 (0.8%)
Fever	1 (0.8%)
Atrial fibrillation	1 (0.8%)
Migraine with aura	1 (0.8%)

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Secondary endpoint results

6-month device events

- Low rate of device events through 6 months*,[1]

Defect size[1] (mm)	Device size (mm)	Device event description	Onset day
20	37	Device embolization	0
23	44	Supraventricular tachycardia	1
25.5	44	Device embolization	0

* Defined as post-procedure embolization, device removal, or other device reintervention from completion of the implant procedure through 6 months (180 days) post-procedure.

Secondary endpoint results

Clinically significant new arrhythmia*,1

- Low rate of clinically significant new arrhythmia*,1

Subgroup analysis[3]	Clinically significant new arrhythmia	Subgroups *p*-value
Overall	**4.8% (6 / 125)**	**N / A**
Age at procedure	<18 = 1.1% (1 / 90) >18 = 14.3% (5 / 35)	0.007
Defect size group	≤ 17.5 mm = 1.4% (1 / 70) >17.5 mm = 9.1% (5 / 55)	0.09
Device size group	27, 32, 37 mm = 0.0% (0 / 92) 44, 48 mm = 18.2% (6 / 33)	0.0002
Device oversized**	Yes = 14.3% (4 / 28) No= 2.1% (2 / 97)	0.02

- The incidence of clinically significant new arrhythmia is similar between subgroups defined for sex, weight, multiple fenestrations, atrial septal aneurysm, and deficient aortic rim.
- Significant differences between subgroups were seen for age, defect size, device size, and device oversized, with lower risk of arrhythmia for subjects who were pediatric, with smaller defect, and with smaller device size, and higher risk for those with oversized device.

* In subjects without prior history of arrhythmia, any new arrhythmia (documented on ECG) requiring hospitalization, initiation of new long-term medical therapy (persisting > 45 days), or any post-index procedure cardioversion or intervention (pacemaker, ablation, etc.).

** Device is used to treat a defect with a diameter smaller than the recommended diametrical range per the *Instructions for Use* (IFU).

Gore ASSURED Clinical sites

- Children’s Hospital of Philadelphia
- Columbia University Medical Center
- Primary Children’s Hospital / University of Utah
- Mayo Clinic — Rochester
- Carolinas Medical Center
- Boston Children’s Hospital
- Children’s Hospital of Michigan
- University of California, Los Angeles
- Seattle Children’s Hospital
- University of Michigan
- Children’s Hospital of Colorado
- Yale University
- Mount Sinai
- Riley Children’s Hospital
- Phoenix Children’s Hospital
- Nicklaus Children’s Hospital
- Texas Children’s Hospital
- Nationwide Children’s Hospital
- Cincinnati Children’s Hospital
- Cleveland Clinic
- Massachusetts General Hospital
- Children’s Healthcare of Atlanta

References

1. GORE® CARDIOFORM ASD Occluder [*Instructions for Use*]. Flagstaff, AZ: W. L. Gore & Associates, Inc; 2019.
2. GORE® CARDIOFORM ASD Occluder Imaging Training Tool. Flagstaff, AZ. W. L. Gore & Associates; 2017. [Digital training tool]. AW0214-EN1.
3. Gore ASSURED Clinical Study.

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Products listed may not be available in all markets.

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