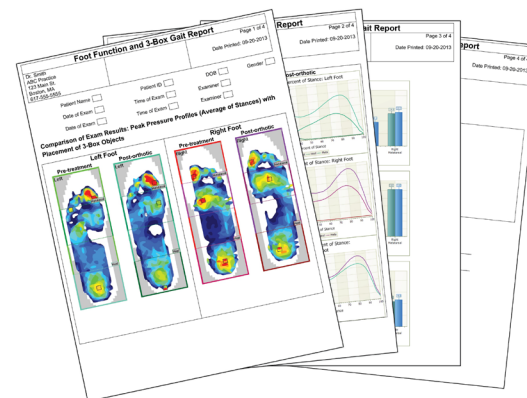


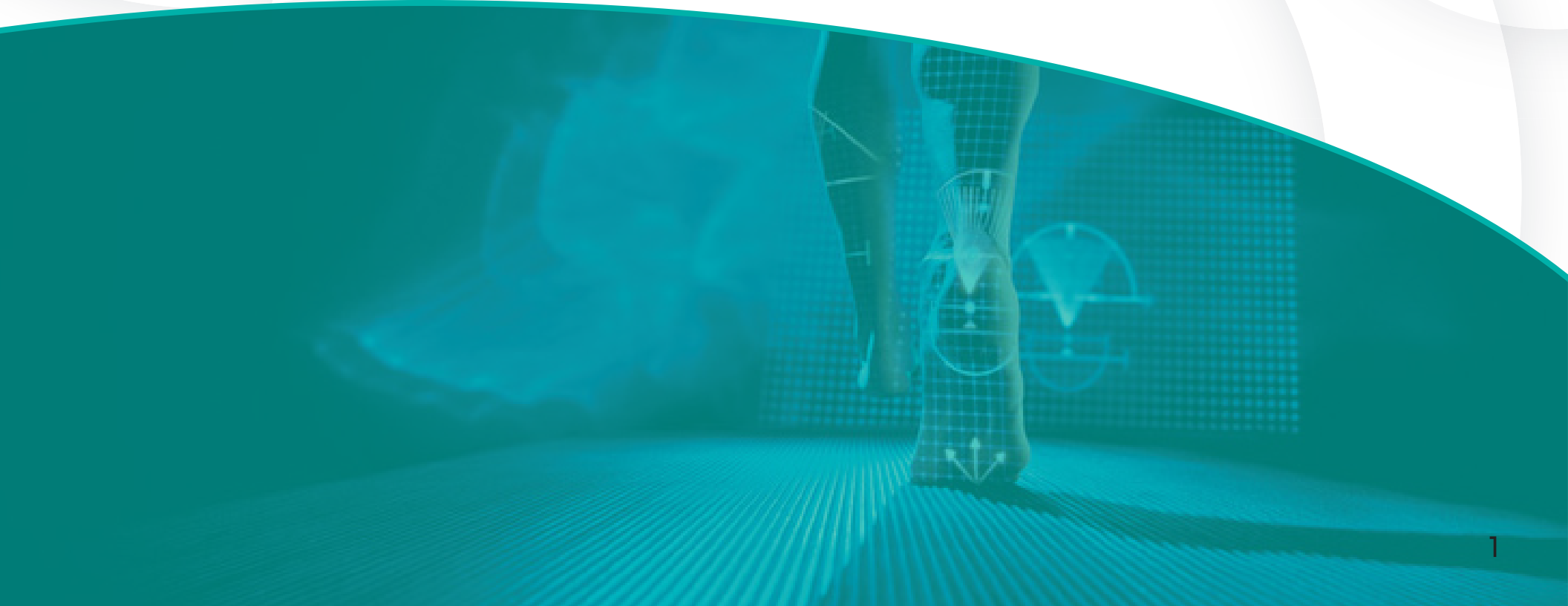


Choosing a Gait Analysis Solution



INTRODUCTION

Regardless of your needs for gait analysis, it can be challenging to determine what type of technology might be the most beneficial to your work. We have compiled this guide to help you navigate the process by addressing common questions that arise when choosing a gait analysis system. We will show you how Tekscan technology can enhance your gait analysis, what kind of data you can gather, and also review available systems. Our goal is to help you choose the right system based on your application, subjects, environment, and data needs.



WHY DO I NEED GAIT ANALYSIS?

Gait analysis is a broad term which covers any technique for analyzing a person's or animal's walking or movement patterns. While there are a number of forms and methods for gait analysis, those involving technology will provide objective data unlike traditional observational gait analysis. Even for experienced professionals, observational gait analysis provides limited insights.

WHY TECHNOLOGY?

Many asymmetries cannot be seen with the naked eye, so you might be wondering about ways to collect this information. Adding gait analysis technology to your practice has shown to have a positive effect on treatment outcomes.

We've pulled together some questions and answers to help get you started with gait analysis technology.

WHAT DOES TEKSCAN TECHNOLOGY ADD TO VISUAL GAIT ANALYSIS?

Visual gait analysis only looks at the motion of the gait cycle, not the force or weight distribution, so subtle asymmetries can easily be missed. Advanced gait analysis solutions will provide objective data to develop your treatments.

TRACK PROGRESS OVER TIME

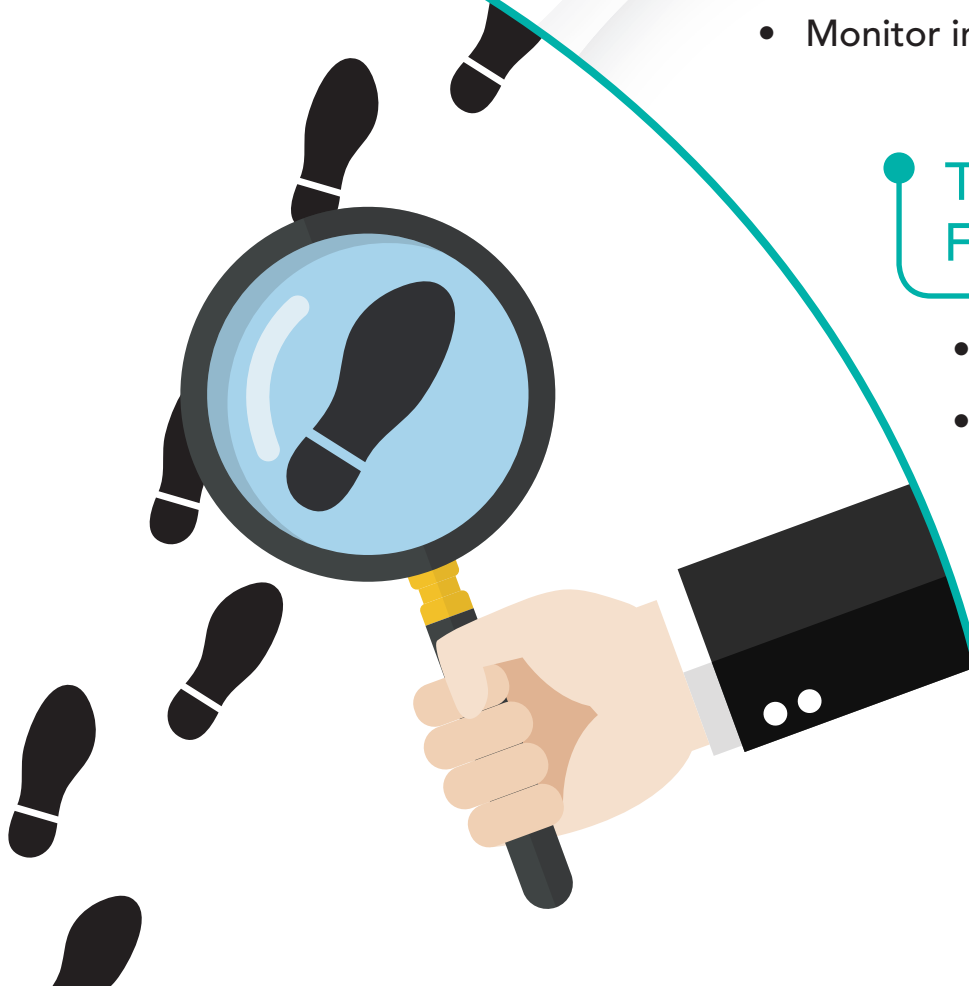
- Use quantifiable data that visual observation lacks.
- Monitor improvements using baseline data.

TANGIBLE, ACTIONABLE DATA FOR DIAGNOSIS

- Prevent injuries by diagnosing asymmetries.
- Identify hard-to-diagnose pain points.

TREATMENT EFFECTIVENESS

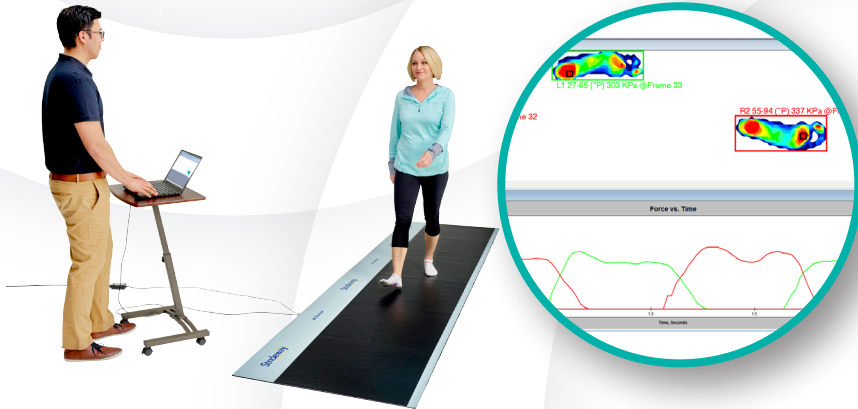
- Optimize movements/efficiency with objective data.



WHAT IS THE DIFFERENCE BETWEEN IN-SHOE & PLATFORM SYSTEMS?

Both Tekscan's in-shoe and platform based gait analysis systems provide insights into pressure, force, and how the foot is functioning. Depending on the application, one type of system might be more suitable.

PLATFORM SYSTEM



(Strideway System shown)

- Calculates spatial-temporal parameters like stride length
- Captures multi-sequential steps
- Better understanding of foot and arch type through barefoot data collection
- Size allows for walking aids to be used during analysis

IN-SHOE SYSTEM



(F-Scan System shown)

- See pressure & function inside the shoe
- Test the effects of treatment with orthotics
- Freedom of testing environment
- Prevents targeting, where the subject alters their gait when walking on a mat

WHAT MAKES TEKSCAN DIFFERENT FROM OTHER PLATFORM SYSTEMS?

Featuring a low profile and end cap tiles, Strideway eliminates the need for a subject to step up or down. You are always collecting natural gait data.

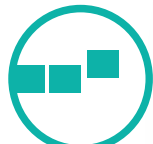
Strideway offers temporal, spatial, kinetic, and pressure data. Other systems provide temporal and kinetic data but limited pressure information. The Strideway captures **256 levels of pressure/force resolution**, allowing clinicians to identify areas at risk for ulceration, stress fractures, or pain points for the patient.



Calibrated pressure & force data



Calculates temporal & spatial parameters



Modular platform - add/subtract length at any time



Tight sensor resolution provides accurate representation of gait



Quick set up and data collection process

Gait Cycle Table (sec)	Subject1		
	Left	Right	R-L Diff
Gait Cycle Time	1.48	1.48	0.00
Stance Time	1.00	1.02	0.02
Swing Time	0.48	0.46	-0.02
Single Support Time	0.43	0.45	0.02
Initial Double Support Time	0.26	0.32	0.06
Terminal Double Support Time	0.32	0.26	-0.06
Total Double Support Time	0.58	0.58	0.00
heel Contact Time	0.73	0.80	0.07
heel off Time	0.56	0.45	-0.11
heel strike Time	0.45		

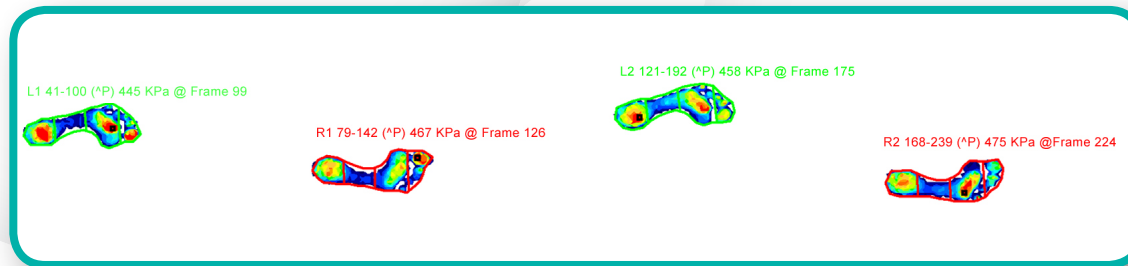
Data is displayed in easy to read and compare tables.



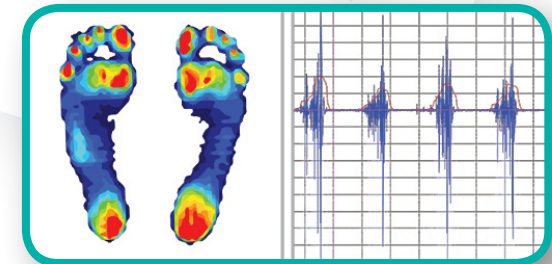
Tile design provides easy storage, portability, and the ability to add length.

WHAT IS THE DIFFERENCE BETWEEN A WALKWAY & A FORCE PLATE?

While force plates measure total force applied on top of the plate, Tekscan's systems measure multiple points simultaneously in a dynamic and detailed pressure map. Pressure maps provide important, actionable information not available from a force plate, such as contact and peak pressure data across an area.



Tekscan's pressure measurement systems offer a larger platform for capturing multiple foot steps.



Optional feature enables plantar pressure to be synchronized with EMG data, providing a complete picture.

Pressure mapping also offers the ability to segment views by foot and even isolate ground reaction force and center of pressure by foot region, thereby furthering analysis into foot function, balance, sway, and more. Because of its versatility and capacity to isolate force measurements, pressure mapping should be considered an important element in gait analysis.

FORCE PLATES

- Provide 3-dimensional ground reaction forces
- Apply to different joint centers through inverse dynamics to gain greater understandings of gait pathologies
- Insights into the effects on loading of various joints in the body

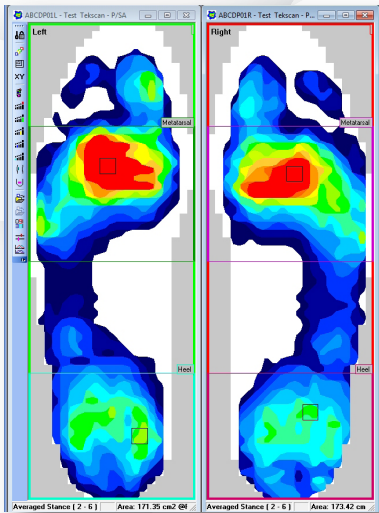
PRESSURE MEASUREMENT

- Provides vertical force
- Ease of use—many are 'plug and play'
- Calibration by user
- Synchronize with complementary technology

WHY PRESSURE MEASUREMENT FOR GAIT ANALYSIS?

There are many types of gait analysis systems available. Pressure measurement solutions is just one category. Learn more about why information provided by these systems is an important part of a gait assessment.

INJURY PREVENTION



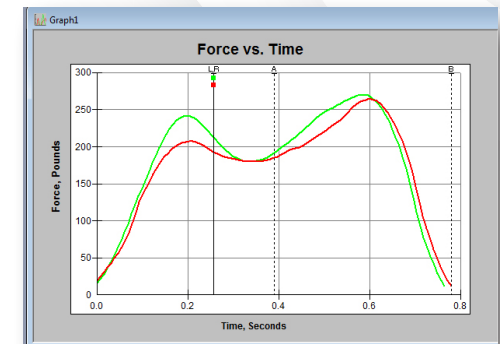
- Insights into potential stress fractures, ulcerations, pain points
- Detect instability for falls risk patients

FLEXIBILITY



- Capture data in different environments & multiple foot strikes
- Indication of what might be happening during movement

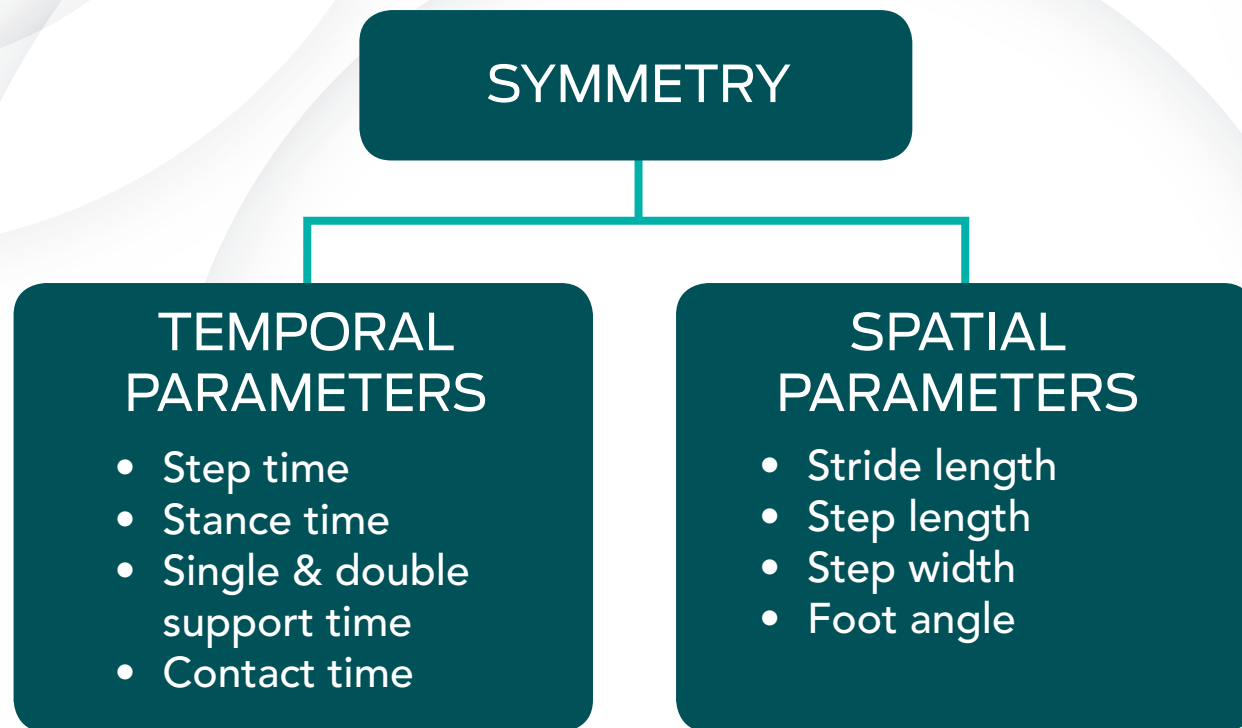
COMPREHENSIVE DATA



- Vertical ground reaction force
- Pressure distribution
- Impulse & integral

WHAT KEY INSIGHTS CAN I OBTAIN FROM FROM A GAIT ANALYSIS SYSTEM?

In general, asymmetry between left and right sides is a key indicator that there could be a problem with gait. More specific insights to evaluate will depend on the patient and pathology. According to research, gait parameters such as speed, step length, cadence, and step width can be indicators of fall risk¹. Tekscan solutions provide a number of essential parameters for gait analysis.

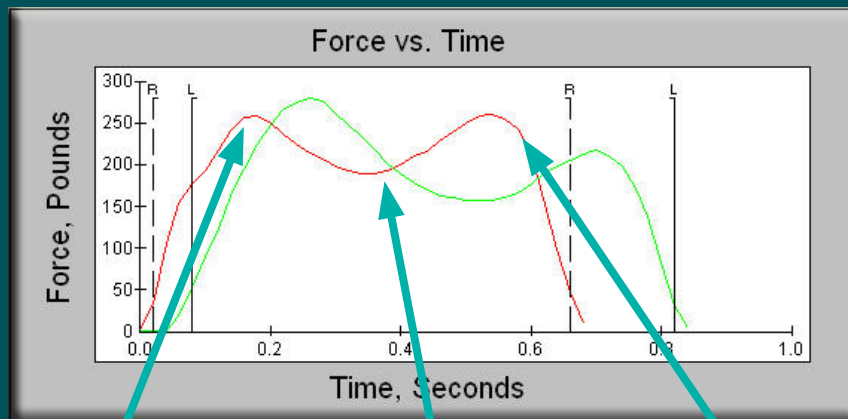


1. Espy, D. D., Yang, F., Bhatt, T., & Pai, Y.-C. (2010). Independent Influence of Gait Speed and Step Length on Stability and Fall Risk. *Gait & Posture*, 32(3), 378–382.

WHAT INFORMATION WILL A TEKSCAN GAIT ANALYSIS SYSTEM PROVIDE?

Regardless of whether you select an in-shoe or platform based gait analysis solution, Tekscan's systems provide essential parameters for a complete gait analysis.

GAIT CURVE



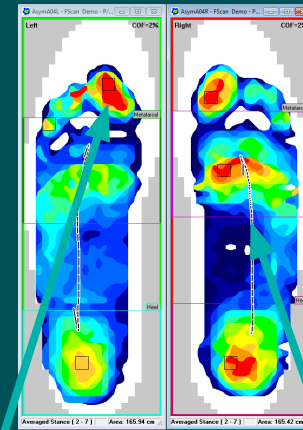
Heel strike

Midfoot strike

Forefoot strike

Green and red lines distinguish between the left and right foot, helping you to identify asymmetries in gait. For example a post-operation patient could still be favoring one leg, indicating there's still an issue.

PRESSURE PROFILES



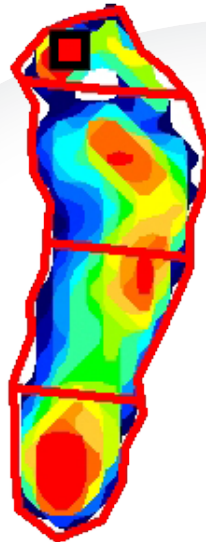
Areas of high pressure can indicate potential ulcers, stress fractures, or pain points.

Center of Force can be an indicator of stability.

WHAT INFORMATION WILL A TEKSCAN GAIT ANALYSIS SYSTEM PROVIDE? (continued)

OBJECTIVE DATA TO MAKE MORE INFORMED DECISIONS

Gait Cycle Table (sec)	Subject1		
	Left	Right	R-L Diff
Gait Cycle Time	1.48	1.48	0.00
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Initial Double Support Time	0.26	0.32	0.06
Terminal Double Support Time	0.32	0.26	-0.06
Total Double Support Time	0.58	0.58	0.00
Heel Contact Time	0.73	0.80	0.07
Foot Flat Time	0.56	0.45	-0.11
Midstance Time	0.45	0.48	0.03
Propulsion Time	0.27	0.21	-0.05
Active Propulsion Time	0.01	0.03	0.03
Passive Propulsion Time	0.26	0.31	0.05



- Temporal parameters
- Spatial parameters
- Easy symmetry comparison charts

- Pressure distribution
- Foot segmentation for detailed analysis

- Educate patients with visuals
- Evaluate treatment effectiveness & validate progress over time



How long does a full assessment take?

- Data collection can be done in as little as 2 minutes
- Much of the data is automatically calculated

WHAT TYPE OF SYSTEM IS RIGHT FOR ME?

Now that you understand the value in using technology in your gait analysis, here are some things to consider when determining which type of system is right for you.

PATIENTS

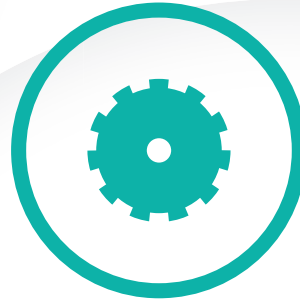


Who will you be testing with the system?

Young children, geriatrics, or patients with mobility aides may have difficulty with an in-shoe system.

Strideway is wide enough to accommodate mobility aides like walkers.

APPLICATION



What type of testing will you be doing, and where?

Both F-Scan and Strideway are portable systems, but Strideway requires a larger floor space once assembled.

F-Scan offers flexibility for changing environments, but Strideway can provide insights into patient stability.

DATA



What type of data do you want to collect?

Both Strideway and F-Scan capture force, pressure and timing information that other systems do not.

Strideway provides spatial information such as stride length that F-Scan does not, but F-Scan has a faster data collection rate, essential in certain sports applications.

WHAT TYPE OF SYSTEM IS RIGHT FOR ME? (continued)

SPACE



Do you have space constraints?

Strideway is available in custom sizes to fit your space, but can also be quickly disassembled for storage when needed.

F-Scan requires little storage space, is portable, and can be used in spaces of any size.

TIME



How much time do you spend with each patient?

Strideway requires little setup time, and data can be quickly shared with the patient.

F-Scan requires that sensors be trimmed to fit the patient, adding minimal time to the visit.

TEKSCAN GAIT ANALYSIS SOLUTIONS

Tekscan's gait analysis solutions capture multiple sequential foot strikes and provide more than just pressure information! Different resolutions are available to accommodate all patient types.

F-SCAN SYSTEM

VAST DATA OPTIONS

- Datalogger option for extended duration of data collection
- Several software add-ons for extensive analysis

HIGHLY PORTABLE

- Collect data in any environment
- Minimal storage space required

VERSATILE

- Integrates with other gait lab technologies (EMG, motion capture systems, force plate)
- Optimized for a variety of additional applications, like running or jumping



STRIDEWAY SYSTEM

ROBUST DATA

- Provides pressure and force measurement plus temporal (time) and spatial (distance) parameters

LARGE SIZES

- Active sensing length from approx. four to seventeen feet

MODULARITY

- Add/subtract tiles to adjust length at any time

DIVERSE PATIENT POPULATIONS

- Accommodates a variety of patients including those with canes or walkers



CONCLUSION

Tekscan provides accurate information empowering clinicians and researchers to increase the validity and effectiveness of your treatments and/or research. Regardless of which system you choose, you are obtaining accurate, repeatable data for a broad range of tests and insights.

- Data you can trust – Backed by research
- Versatile use for many evaluations
- Accurate, repeatable, objective data

Visit www.tekscan.com/gait-analysis-systems
or call 1.617.464.4282 for more information

