Seated Solutions Business Model

Kyle Fieleke

Table of Contents:

Executive Summary

The goal of Seated Solutions is to deliver a more comfortable sitting experience to the people who need it most. Our cushions are designed to fit everyone's needs. We do this by understanding your individual situation and how to make it more comfortable. For the first time, you can pick from a selection of cushions made to fit you budget and your bottom.

We predict total startup costs to be around $550,000 but right now we are seeking a seed investment of $150,000. We anticipate becoming profitable during year three and hitting the breakeven point before the end of year four.

The Problem

Back pain is the number one cause of job-related disability in the United States (Upper & Middle Back Pain: Symptoms, Causes, & Risk Factors (webmd.com)). At any given time approximately 577 million people worldwide experience back pain. Of those, 54% of Americans that experience back pain spend most of their day at work sitting, but most people never know the primary cause of their pain, so they treat the symptoms rather than the cause. Approximately 50% of people surveyed report that pain killers are their go-to method of dealing with lower back pain (Ways to relieve back pain adults U.S. 2017 | Statista). This is problematic because Americans are becoming more and more dependent on unnecessary medications and at least a third of compensable back injuries are preventable through ergonomics (Back Injuries Fact Sheet | Environmental Safety, Sustainability and Risk (umd.edu)).

The cheapest, easiest, and most effective long-term method to treat back pain exacerbated by sitting down is the use of a seat cushion. In fact, back pain can sometimes be avoided all together with the use of a properly designed seat cushion. Not every seat cushion works well for every patient though. Unfortunately, customers often have to try out a few before finding one that works for them and sometimes, they never find that one at all. This process can take weeks or months in the post-COVID internet-based economy depending on shipping times that have been further lengthened by worldwide supply chain issues.

The Solution

Now imagine getting the right seat cushion for your needs, your back, and your butt the first time, every time. This is where Seated Solutions comes in. There will be a catalog of options designed and manufactured to fit the needs of every customer. The automated manufacturing, testing, and optimizing processes created by Professor Keith Brown at the Boston University College of Engineering use machine learning to allow for the rapid development of compliant mechanisms fit to specific force-displacement curves. A compliant mechanism is a flexible object that achieves force or motion transmission or modulation through elastic deformation. Professor Brown's mechanisms are additively manufactured using polymers and elastomers and come in many shapes and sizes. A group of these mechanisms can be put together to fit the

topography of a person's backside, be supportive and firm where necessary, and remain soft to apply little pressure in the sensitive places. In other words, the properties can easily be changed throughout the area of the cushion which allows for a customizable experience.

A 55-year-old, 225-pound male office worker with sciatica has different needs than a 27-year-old, 120-pound female truck driver with a sore coccyx, but they both have need of a seat cushion. Now they will both be able to find what they need at our one-stop-shop. There will be an online BuzzFeed-style quiz advertised to our target demographic and to people searching for things related to a few key words like "seat cushion" or "back pain." The results of the quiz will describe their issue and link to the seat cushion that could solve it.

Market Assessment

To make an accurate estimate of the market size, we first need a preliminary price for the product. Most seat cushions currently on the market range from $25 to $80 with the most popular ones sitting around $40. As the product is intended to be a somewhat high-end option that promises to fill the customer's needs without having to try any alternatives, it can be priced slightly on the higher end at $50.

In similar industries that sell relatively simple physical products, the ability to choose the properties to fit your needs is worth 10-30% of the product value. For example, standard Converse sneakers are worth ~$75 and custom Converse sneakers are worth ~$95. A custom 21 fluid ounce Hydro flask costs ~$38 where a standard one costs ~$35. It is not a perfect comparison, but based on this model, our products can cost approximately 20% more than a standard seat cushion. This again brings our approximated product value to $50.

It is estimated that Americans spend somewhere on the order of $50 billion annually on treating back pain, but the back pain industry is already a saturated market, so it is important that we narrow our focus to a specific customer base (OSHA Technical Manual (OTM) - Section VII: Chapter 1 | Occupational Safety and Health Administration). The target market includes some people without back pain as well like wheelchair users, frequent travelers, seniors, post-op patients, pregnant women, and gamers. Our customers include anyone who is looking for a more comfortable sitting experience.

Figure 1 below shows an analysis of the market size and target demographics. This brings us to an estimated market size of $297.5 million.

	US Pop.	% that might buy	Market populatio
Cost per product	$50		
Pot. back injury cust.	2000000	10%	200000
Pot. Wheelchair cust.	3000000	10%	300000
Truckers	3500000	40%	1400000
Office workers	100000000	1%	1000000
Pregnant women	6000000	5%	300000
Senior citizens	50000000	2%	1000000
Hemmoroids	3000000	15%	450000
Sciatica	13000000	10%	1300000
	Total market pop.		5950000
	Market size		$297,500,000
	Growth factor		106.30%

Figure 1

The rate of adoption will likely be somewhat slow considering the saturation of the market, so we will take that into account in later financial modelling.

The current market ecosystem brings up a few additional hurdles to be aware of. The most obvious hurdle is the competition. To overcome the competition, we will need to have both a unique customer value proposition and powerful partners. These partners include raw material vendors, manufacturing partners, freight companies, advertisers, and distributors. Research and development will of course be done in-house.

Perhaps our most important partner will be Amazon because approximately 50% of online retail in the United States goes through them. The second most important partner will be our manufacturing partner for the fabric exterior. A few potential manufacturers include Billoomi Fashion, Dewhirst, and Zega Apparel. We will also need shipping partners like FedEx, USPS, and/or UPS and advertising partners like Google and Meta. Finally, we may eventually want in-person retail partners. A few options there include Walmart, Bed Bath and Beyond, Target, HomeGoods, and Kohl's.

Business Model

Seated Solutions' mission is to deliver comfort to your door without the hassle of having to try multiple products. There will be a selection of around ten different cushions intended for different needs and each will come in small, medium, and large versions that vary in size and strength depending on the weight of the person.

The company will be run by Kyle Fieleke and Professor Keith Brown. Because it is starting as a university project, much of the work to get the company started will be done by students which brings the cost of product development and prototyping down significantly. After the first year of development, most of the cushions will be ready for production. At this point, we

will rent a small industrial workspace where we can set up shop manufacturing the cushions. Below is a figure showing the elements of each cushion.

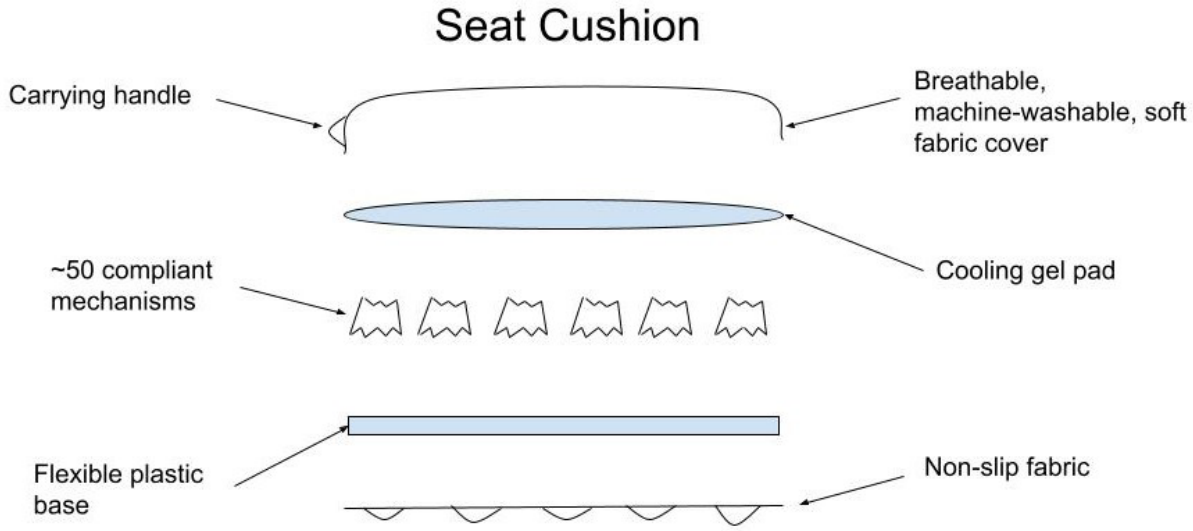


Figure 2

Each of the parts other than the compliant mechanisms will be outsourced to an overseas supplier to reduce cost while retaining quality. The mechanisms will be additively manufactured for the first two years because sales volume is expected to be sufficiently small such that an injection molding machine will not be necessary. Compliant mechanism printing, product assembly, and packaging will all take place in the same workspace.

To validate the product impact, we would ideally conduct clinical trials, but they are costly, so instead we will start with testimonials. These will be seen as less trustworthy, so we will start trials during year three after another series of funding. These trials will test the effectiveness of our products to reduce the occurrence of pressure ulcers in the elderly, reduce back pain in a work setting, and increase comfort in post-op patients. When the trials are complete after approximately two years, they will be a valuable marketing asset and result in greater acceptance of the product as a solution for common ailments.

The cushions will be sold primarily through our own website and through e-retailers though we also plan to expand to in-person retailers later. We anticipate e-retailers to take an average of 15% of all sales made through them.

During the second year, we also plan to develop a few new products including lumbar pillows and heating pads that can start to be sold during the third year. During the fifth year we will start development on truly custom cushions that will only be available in store. The customer will sit down on a chair-like device that will measure the pressure in different locations and will input their needs for the cushion. Their needs can include things like dimensional requirements, specific illnesses they suffer from, pointing out particularly sensitive areas, special requests regarding the topography, and the location(s) where they anticipate using it most

frequently. We anticipate this option to be most popular for people in wheelchairs who may end up using it all day long. This product is anticipated to be released in year eight as it will require extensive prototyping.

The figure below shows the business canvas for this model.

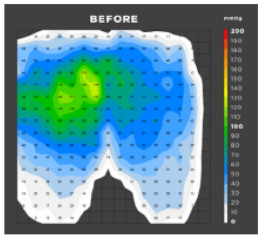
<table>
<tr><th>Problem</th><th>Solution</th><th>Unique Value Proposition</th><th>"Unfair" Advantage</th><th>Customer Segment</th></tr>
<tr>
<td>- Lack of ergonomic seating causing bad posture, butt sores, neck/back pain
- Hard to find right seat cushion that fits your size and your needs</td>
<td>- Many products available for different problems and sizes of person
Key Metrics
- Purchases from website
- Purchases from e-retailers
- Purchases in person
- Customer satisfaction</td>
<td>- Custom experience for same price
  </td>
<td>- Research/ development and manufacturing done in-house
- Compliant mechanisms
Channels
- Website
- e-retailers
- In person retailers</td>
<td>- Wheelchair users, frequent travelers, seniors, post-op patients, pregnant women, and gamers, office workers, truck drivers
- Anybody with neck/back pain, sciatica, hemorrhoids, coccyx pain</td>
</tr>
<tr><th colspan="3">Cost Structure</th><th colspan="2">Revenue</th></tr>
<tr>
<td colspan="3">- Product price ranging $30-$80 depending on product size and specialty, average $50
- Also do custom cushions, lumbar pillows, and heating pads later on</td>
<td colspan="2">- Product sales
- Investment</td>
</tr>
</table>

Figure 3

The exit strategy for this model is to sell either the business or the technology to a larger business like ComfiLife or Purple by year ten.

Financial Forecast

Figure 4 below shows an estimated adoption rate for the product and subsequent sales numbers based on the market size.

Year	0	1	2	3	4	5
Market size	$297,500,000	$316,242,500	$336,165,778	$357,344,221	$379,856,907	$403,787,893
# cust.	5950000	6324850	6723316	7146884	7597138	8075758
Adoption rate	0%	0.02%	0.10%	0.25%	0.50%	0.85%
Units sold	0	1265	6723	17867	37986	68644
Revenue	$0	$63,248.50	$336,165.78	$893,360.55	$1,899,284.54	$3,432,197.09

Figure 4

Figure 5 below shows a rough initial five-year forecast for the company.

Year		0	1	2	3	4	5
Costs							
	Design and prototypir	$15,250	$10,000	$3,000	$2,000	$10,000	$10,000
	Rent	$0	$18,000	$18,000	$26,000	$26,000	$26,000
	Utilities	$0	$4,860	$5,000	$10,000	$12,000	$14,000
	Insurance	$0	$756	$756	$900	$900	$900
	Marketing & Ads	$0	$15,000	$25,000	$45,000	$60,000	$80,000
	Customer Service	$0	$5,000	$10,000	$40,000	$55,000	$75,000
	Web development	$0	$3,000	$1,000	$1,000	$1,000	$1,000
	Capital Equipment	$0	$3,200	$1,000	$8,000	$1,000	$1,000
	Materials	$0	$8,222	$23,532	$62,535	$132,950	$240,254
	Outsourced parts	$0	$7,590	$53,787	$142,938	$303,886	$549,152
	Assembly labor	$0	$15,000	$30,000	$40,000	$80,000	$100,000
	Patents	$0	$2,000	$10,000	$2,000	$10,000	$10,000
	Travel	$0	$5,000	$5,000	$5,000	$5,000	$5,000
	Testimonials	$0	$6,000	$3,000	$0	$0	$0
	Clinical trials?	$0	$10,000	$60,000	$60,000	$20,000	$0
	Founders' salary	$0	$120,000	$150,000	$180,000	$200,000	$200,000
	Sales' salary	$0	$30,000	$60,000	$120,000	$120,000	$180,000
	Total	$15,250	$263,628	$459,074	$745,373	$1,037,735	$1,492,305
Revenue							
	Sales	$0	$63,248.50	$336,165.78	$893,360.55	$1,899,284.54	$3,432,197.09
	After taxes and fees	$0	$50,598.80	$268,932.62	$714,688.44	$1,519,427.63	$2,745,757.67
Annual total		($15,250)	($213,029.33)	($190,141.51)	($30,684.48)	$481,692.19	$1,253,452.34
Overall Total		($15,250)	($228,279.33)	($418,420.83)	($449,105.32)	$32,586.87	$1,286,039.21

Figure 5

Figure 6 shows a graph of the above information. According to estimates, we will become profitable in year three and hit the break-even point during year four.

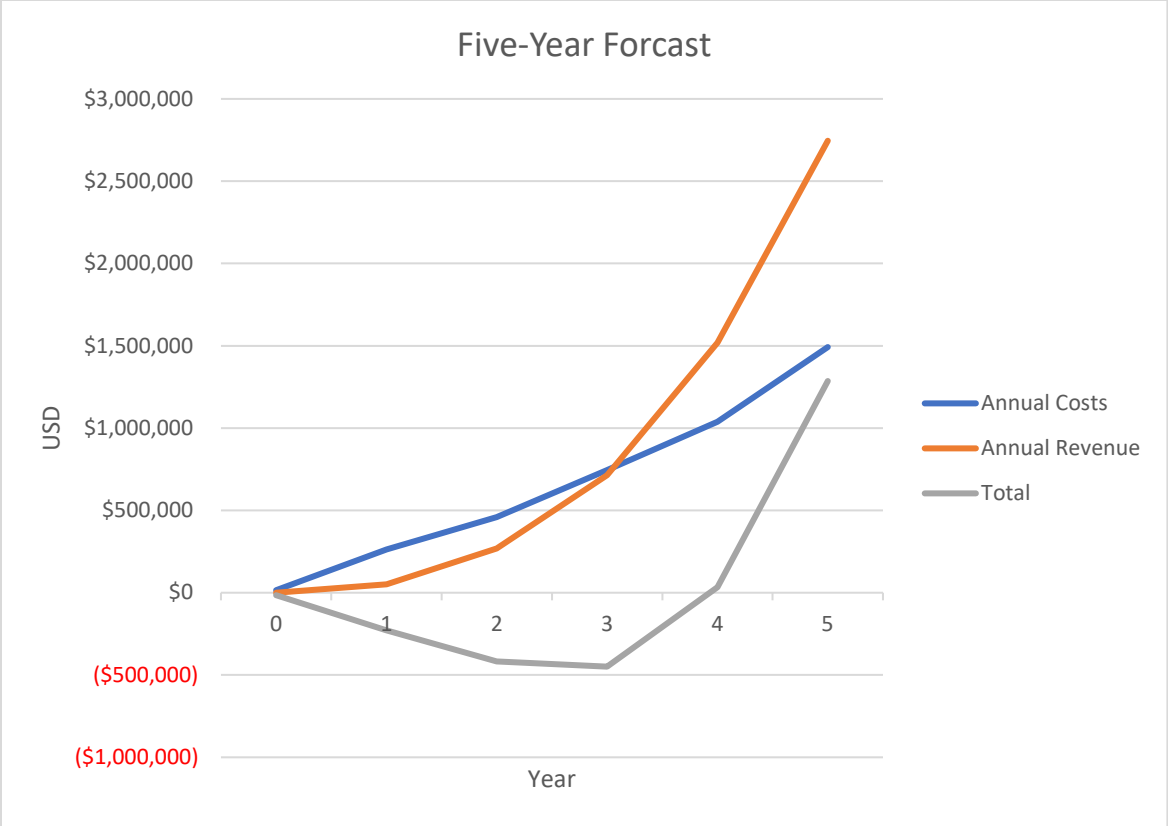


Figure 6

The following figures are a more precise estimate and show key assumptions used for financial modelling, a projected income statement, balance sheet, and cash flow statement. As seen in balance sheet and cash flow statement, a total of $550,000 will be required to become profitable and more may be required later to expand the operation.

Key Assumptions						
Blue numbers are simply sums of the numbers above them.						
Green numbers are calculated, based upon results elsewhere in the statements.						
	Year 0	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Units sold	0	1,265	6,723	17,867	37,986	68,644
Avg Selling Price	50.00	50.00	50.00	50.00	50.00	50.00
Material Cost per unit	105.00	11.50	11.50	10.00	10.00	10.00
Direct Labor cost per unit	200.00	13.00	10.00	8.00	8.00	8.00
Variable Overhead per unit	0.00	1.15	1.15	1.15	1.15	1.15
Depreciation	0.00	640	840	2,440	2,640	2,840
Other Fixed Overheads	0	31,956	22,756	36,900	37,900	37,900
Days Sales Outstanding	30	30	30	30	30	30
Inventory Days	25	25	25	25	25	25
Days Payable Outstanding	25	25	25	25	25	25
Taxes Payable						
Depreciation Period (years)	5	5	5	5	5	5
Tax Rate	8%	8%	8%	8%	8%	8%
Interest Rate	10%	10.00%	10.00%	10.00%	10.00%	10.00%
Employee Headcount	2	4	4	5	7	9

Figure 7

Income Statement:						
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Sales	400,000	63,249	336,166	893,361	1,899,285	3,432,197
CGS:						
Material	5250	14,547	77,318	178,672	379,857	686,439
Direct labor	10000	16,445	67,233	142,938	303,886	549,152
Variable Overhead	0	1,455	7,732	20,547	43,684	78,941
Fixed Overhead	0	32,596	23,596	39,340	40,540	40,740
Total CGS	15,250	65,042	175,879	381,497	767,966	1,355,271
Gross Margin	**384,750**	**(1,794)**	**160,287**	**511,863**	**1,131,319**	**2,076,926**
Sales & Marketing	0	66,000	158,000	265,000	255,000	335,000
G&A	0	130,000	166,000	188,000	216,000	216,000
(EBIT) Operating Profit	384,750	(197,794)	(163,713)	58,863	660,319	1,525,926
Interest Expense		4,982	1,993	0	0	0
Pretax Income	384,750	(202,776)	(165,706)	58,863	660,319	1,525,926
Tax Provision	30,780	(16,222)	(13,257)	4,709	52,825	122,074
Net Income	**353,970**	**(186,554)**	**(152,450)**	**54,154**	**607,493**	**1,403,852**

Figure 8

Balance Sheet						
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Cash	841,807	344,788	128,575	41,424	386,738	1,394,821
A/R	66,667	10,541	56,028	148,893	316,547	572,033
Inventory	0	21,681	58,626	127,166	255,989	451,757
Other C/A	0	0	55	60	65	65
Total C/A	**908,474**	**377,010**	**243,284**	**317,543**	**959,339**	**2,418,676**
Fixed Assets	0	3,200	4,200	12,200	13,200	14,200
Acc Depreciation	0	640	1,480	3,920	6,560	9,400
Net Fixed Assets	0	2,560	2,720	8,280	6,640	4,800
Total Assets	**908,474**	**379,570**	**246,004**	**325,823**	**965,979**	**2,423,476**
Liabilities & Equity:						
Notes payable						
Current Portion LTD	0	0	0	0	0	0
Accounts Payable	656	1,818	9,665	22,334	47,482	85,805
Accrued Expenses	0	16,333	27,000	37,750	39,250	45,917
Accrued Taxes	3,848	(2,028)	(1,657)	589	6,603	15,259
Total C/L	**4,504**	**16,124**	**35,008**	**60,673**	**93,335**	**146,981**
LTD	0	0	0	0	0	0
S/E:						
Preferred Stock	0	0	0	0	0	0
Capital Stock	550000	550000	550000	550000	550000	550000
Current Year Dividends	0	*0*	*0*	*0*	*0*	*0*
Retained Earnings	353,970	(186,554)	(339,004)	(284,849)	322,644	1,726,495
Total Equity	**903,970**	**363,446**	**210,996**	**265,151**	**872,644**	**2,276,495**
Total Liab & S/E	**908,474**	**379,570**	**246,004**	**325,823**	**965,979**	**2,423,476**

Figure 9

Cash Flow:						
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Net Income	353,970	(540,524)	(152,450)	54,154	607,493	1,403,852
Depreciation	0	640	840	2,440	2,640	2,840
	353,970	**(539,884)**	**(151,610)**	**56,594**	**610,133**	**1,406,692**
Change in W/C:						
A/R	(66,667)	56,125	(45,486)	(92,866)	(167,654)	(255,485)
Inventory	0	(21,681)	(36,946)	(68,539)	(128,823)	(195,769)
Prepaid Exp	0	0	(55)	(5)	(5)	0
A/P	656	1,162	7,846	12,669	25,148	38,323
Accr Liabilities	0	16,333	10,667	10,750	1,500	6,667
Accr Taxes	3,848	(5,875)	371	2,246	6,015	8,656
Cash Flow from Oper	**291,807**	**(493,819)**	**(215,213)**	**(79,151)**	**346,314**	**1,009,083**
Financing /Investing Act.						
Fixed Asset Purchases	0	(3,200)	(1,000)	(8,000)	(1,000)	(1,000)
Sale of Stock	550,000	0	0	0	0	0
Dividends	0	0	0	0	0	0
Bank Borrow (Repay)	0	0	0	0	0	0
Net Financing/Inv Act.	**550,000**	**(3,200)**	**(1,000)**	**(8,000)**	**(1,000)**	**(1,000)**
Cash Flow	**841,807**	**(497,019)**	**(216,213)**	**(87,151)**	**345,314**	**1,008,083**
Cash Beginning	0	841,807	344,788	128,575	41,424	386,738
Cash Ending	**841,807**	**344,788**	**128,575**	**41,424**	**386,738**	**1,394,821**

Figure 10

Conclusion

After the first four to five years, the company is expected to ramp up in profitability as the target user base learns about our product and most costs are related to manufacturing. At that point we will have more money to spend on research and development as well as advertising in different customer segments thereby further increasing profitability long term. To become profitable, we will need a total of $550,000, but right now we are looking for seed funding of $150,000 in return for 15% equity in order to cover startup costs including development, prototyping, and testing for the first line of products.

Works Cited

OSHA Technical Manual (OTM) - Section VII: Chapter 1 | Occupational Safety and Health Administration

Back Injuries Fact Sheet | Environmental Safety, Sustainability and Risk (umd.edu)

• Ways to relieve back pain adults U.S. 2017 | Statista

Upper & Middle Back Pain: Symptoms, Causes, & Risk Factors (webmd.com)

Prevalence of chronic low back pain: systematic review - PMC (nih.gov)

40 Back Pain Statistics (To Send a Shiver Down Your Spine) (thegoodbody.com)

19 Back Injury Statistics: Spine-Chilling Facts and Figures (thegoodbody.com)

The Handy Guide To Seat Cushions - OrthoSeatingHQ.com

Global low back pain prevalence and years lived with disability from 1990 to 2017: estimates from the Global Burden of Disease Study 2017 - PMC (nih.gov)

Table 46. Severe headache or migraine, low back pain, and neck pain among adults aged 18 and over, by selected characteristics: United States, selected years 1997–2013 (cdc.gov)

Head, back, and hand injuries resulting in days away from work or job transfer or restriction : The Economics Daily: U.S. Bureau of Labor Statistics (bls.gov)

Evaluating and Managing Acute Low Back Pain in the Primary Care Setting - PMC (nih.gov)

How It Works - Research & Development | My Comfort Cushions – My Comfort Cushions

A randomized clinical trial on preventing pressure ulcers with wheelchair seat cushions - PubMed (nih.gov)

Compliant mechanism - Wikipedia

Outdoor Cushions Market in the US| Increase in The Number of Campers to Boost Growth | Technavio (prnewswire.com)