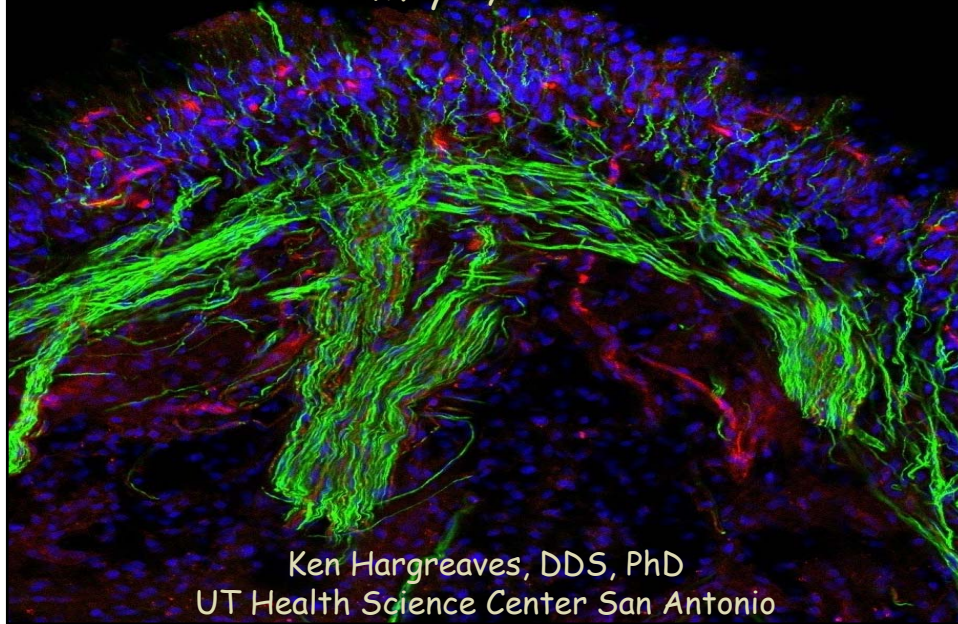


Pain: CE Breakout Session May 2, 2015



The Challenge of Pain

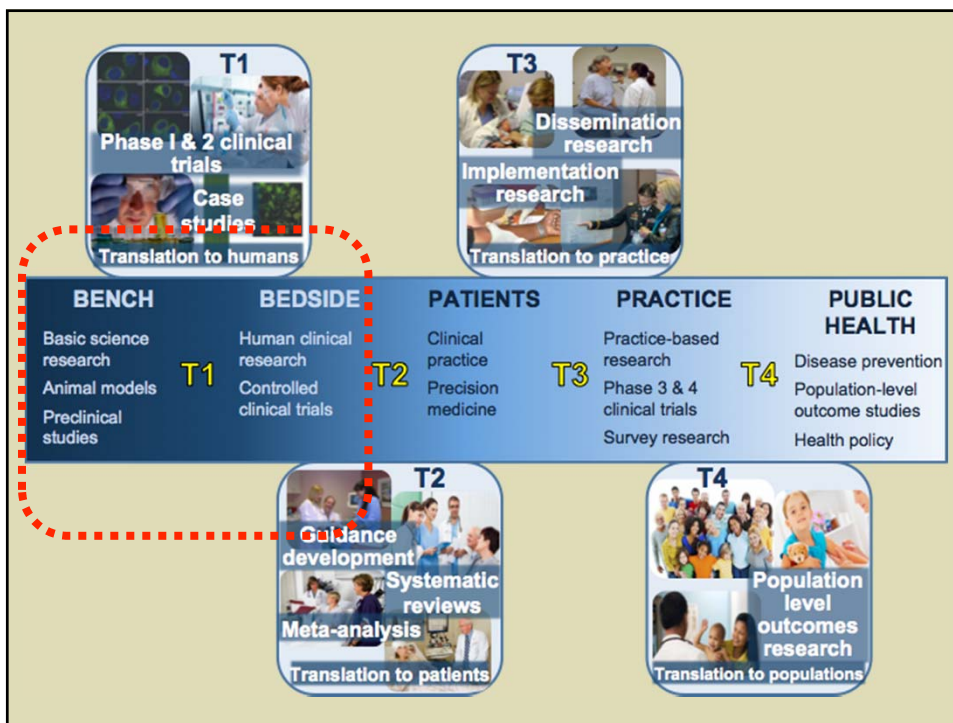
- Prevalence in U.S.
 - Chronic Pain ~100 million
 - Diabetes: 26 million
 - Coronary Heart Disease: 16 million
 - Cancer: 12 million
 - Stroke: 7 million
- } 61 million
- Cost: > \$600 billion
 - Problems with Current Analgesics
 - Opioids: tolerance, dependence
 - NSAIDs: limited efficacy, GI, renal, bleeding
 - COXIBs: MI, stroke
 - Acetaminophen: ~50% acute liver failures

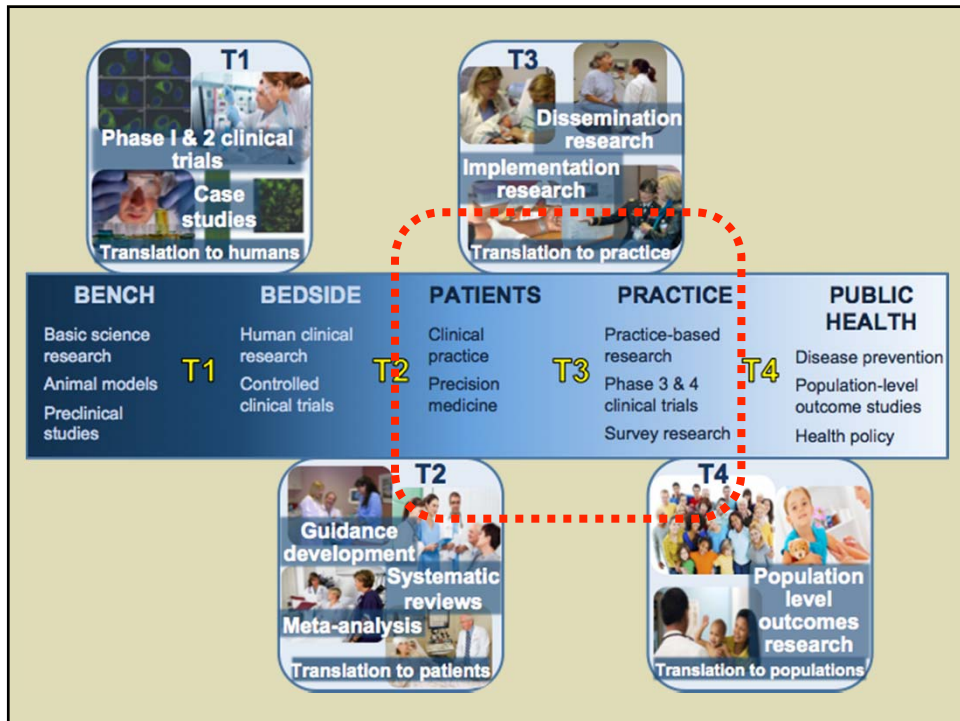
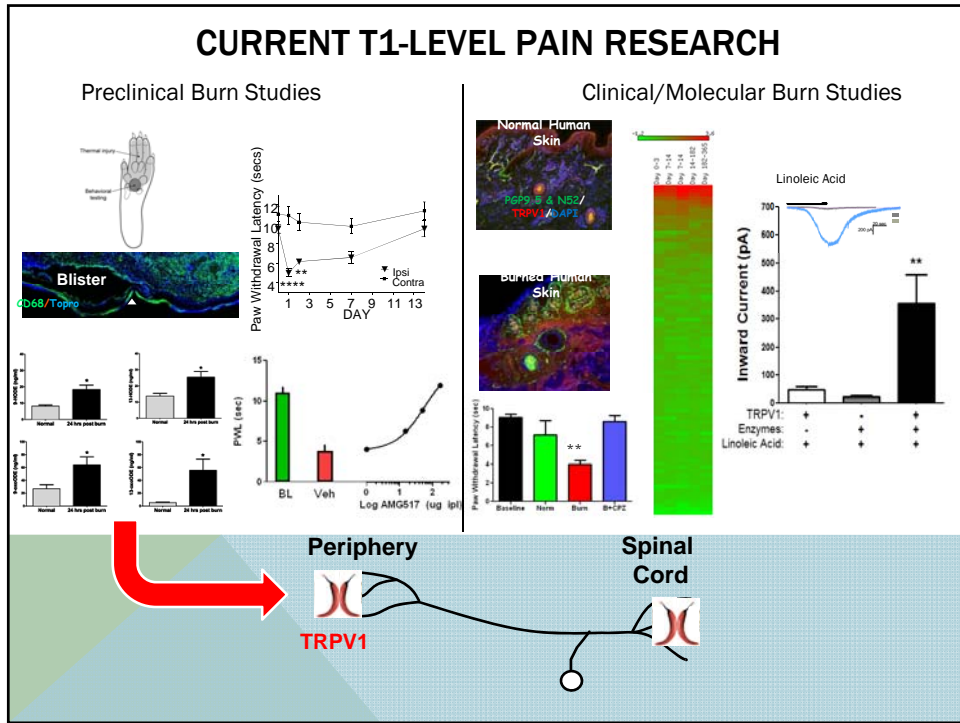
Institute of Medicine 2010

Table 2

Characteristics of included studies.

First author (year)	Sample size (country)	Design	Setting	Method of assessment	Rate (%) of problematic use, %			Quality
					Missed	Abuse	Addiction	
Adams et al. ^{1*}	4279 (USA)	Prospective	Not specified	Q	—	—	4.9	7
Banta-Green et al. ⁵	704 (USA)	Retrospective	Primary care	SI	—	8	13	8
Brown et al. ^{1*}	561 (USA/Puerto Rico)	Prospective	Primary care	C, I, Q, UDS	2.6	—	—	6
Butler et al. ¹¹	95 (USA)	Prospective	Pain clinic	C, I, Q, UDS	46.3	—	—	5
Butler et al. ¹⁰	226 (USA)	Prospective	Pain clinic	C, I, Q, UDS	34.2	—	—	3
Chelminski et al. ¹²	63 (USA)	Prospective	Primary care	C, I, UDS	32	—	—	2
Compton et al. ¹⁴	135 (USA)	Prospective	Pain clinic	C, I, UDS	28	—	—	5
Costo et al. ^{16*}	936,586 (USA)	Cross-sectional	Toxicology laboratory database	UDS	75	—	—	0
Cowan and Wilson-Barrett ^{16*}	104 (UK)	Retrospective	Pain clinic	SI	—	—	2.8	7
Ecklund et al. ^{14*}	9279 (USA)	Cross-sectional	Community database	Q	3.3	—	0.7	5
Ecklund et al. ^{17*}	46,256 (USA)	Cross-sectional	Not specified	INSUR CL	3.2	—	—	5
Remington et al. ^{20*}	801 (USA)	Cross-sectional	Primary care	SI	—	—	3.8	8
Remington et al. ^{21*}	904 (USA)	Cross-sectional	Primary care	SI	—	—	3.4	6
Højsted et al. ^{23*}	207 (Denmark)	Cross-sectional	Pain clinic	CJ	—	—	14.4-19.3	7
Ives et al. ^{24*}	196 (USA)	Prospective	Pain clinic	C, I, UDS	32	—	—	4
Jamison et al. ²⁵	455 (USA)	Prospective	Pain clinic	C, I, S, UDS	24.0-37.1	—	34.1	4
Jamison et al. ^{27*}	110 (USA)	Cross-sectional	Pain clinic	Q	46.4	—	—	1
Katz et al. ^{29*}	122 (USA)	Retrospective	Pain clinic	C, I, UDS	43	—	—	4
Manchikanti et al. ³⁰	100 (USA)	Retrospective	Pain clinic	CJ	24	—	—	6
Manchikanti et al. ^{30*}	500 (USA)	Retrospective	Pain clinic	CJ	9.4	—	8.4	4
Manchikanti et al. ^{30*}	200 (USA)	Cross-sectional	Pain clinic	UDS	3-12	—	—	1
Manchikanti et al. ^{31*}	500 (USA)	Prospective	Pain clinic	CJ	9	—	—	5
Manchikanti et al. ^{31*}	500 (USA)	Prospective	Pain clinic	UDS	9	—	—	3
Meltzer et al. ⁴³	238 (USA)	Cross-sectional	Primary care	SI	11	—	—	4
Meltzer et al. ³⁹	264 (USA)	Cross-sectional	Primary care	CR	—	—	23	8
Morasso et al. ⁴²	127 (USA)	Cross-sectional	Primary care	Q	78	—	—	1
Naliboff et al. ⁴³	135 (USA)	Prospective	Pain clinic	C, I, UDS	27	—	—	5
Poznik et al. ⁴⁵	1160 (USA)	Retrospective	Clinical database	CJ	—	—	6-11	7
Portney et al. ⁴⁶	219 (USA)	Prospective	Clinical trial registry	Q	2.6	—	—	3
Raid et al. ⁴⁷	98 (USA)	Retrospective	Primary care	CJ	24-31	—	—	7
Schneier et al. ⁴⁹	184 (USA)	Retrospective	Pain clinic	C, I, UDS	—	—	15.7	7
Selimon et al. ⁵⁰	797 (USA)	Retrospective	Primary care	CJ	22.9	—	—	5
Skurvelid et al. ^{52*}	17,252 (Norway)	Prospective	Prescription database	CJ	0.08-0.3	—	—	3
Vagstad et al. ^{51*}	184 (USA)	Retrospective	Pain clinic	C, I, UDS	25.5	—	—	5
Wesan et al. ⁵³	455 (USA)	Cross-sectional	Pain clinic	C, I, Q, UDS	34.1	—	—	7
Webster and Webster ⁶¹	183 (USA)	Prospective	Pain clinic	Q	56.3	—	—	6
Wilsey et al. ⁶²	113 (USA)	Cross-sectional	Emergency department	Q	81	—	—	2
Wu et al. ⁶⁶	136 (USA)	Prospective	Pain clinic	C, I, UDS	22.9	—	—	3





The Effectiveness of Pilates Exercise in People with Chronic Low Back Pain: A Systematic Review

Cherie Wells^{1,2*}, Gregory S. Kolt², Paul Marshall², Bridget Hill³, Andrea Bialocerkowski⁴

Table 6. Effectiveness of Pilates exercise versus usual care and physical activity in reducing pain in people with chronic low back pain.

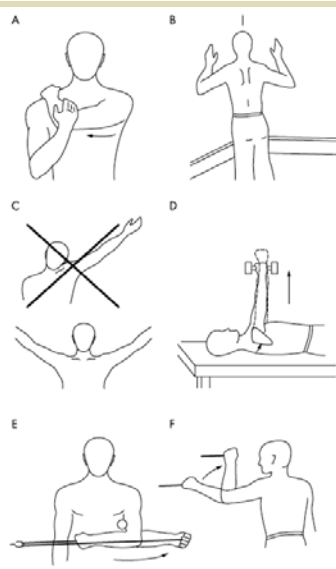
Study	Methodological Quality (Score)	Population [Sample size]	Intervention and Comparison	Outcome Measure(s)	Assessment Timing	Mean Difference [95% confidence interval]
1. Borges et al, 2013 [21]	Very good [13/16]	Chronic low back pain [n=64]	Pilates exercise versus no change in physical activity	Visual Analog Scale	15 weeks	-4.1 [-6.3 to -1.8] ^a
2. da Fonseca et al, 2009 [50]	Poor [4/16]	Chronic low back pain [n=17]	Pilates exercise versus no Pilates exercise	Visual Analog Scale	7-8 weeks	-1.9 [-5.0 to 1.2]
3. Gladwell et al., 2006 [52]	Very good [13/16]	Chronic low back pain [n=34]	Pilates exercise versus usual care and physical activity	Visual Analog Scale - Present Pain Visual Analog Scale - Pain Diary	6 weeks 6 weeks	-0.2 [-0.8 to 0.4] -0.3 [-0.9 to 0.3] [†]
4. Machtyre, 2006 [48]	Excellent [15/16]	Non-specific chronic low back pain [n=86]	Pilates exercise versus no change in physical activity ^b	Visual Analog Scale	3 weeks 12 weeks	-0.4 [-1.7 to 0.9] -1.6 [-3.2 to 0.0]
5. Miyamoto et al, 2013 [24]	Excellent [16/16]	Chronic low back pain for more than 6 months [n=22]	Pilates exercise and education versus education alone	Numerical Rating Scale (11 point)	6 weeks 24 weeks	-2.2 [-3.2 to -1.1] ^a -0.9 [-1.9 to 0.1]
6. Quinn et al, 2011 [25]	Very good [14/16]	Chronic low back pain after physiotherapy [n=25]	Pilates exercise versus no Pilates exercise	Visual Analog Scale	8 weeks	-1.5 [-2.1 to -0.9] ^a
7. Rydeard et al., 2006 [55]	Very good [14/16]	Subacute, chronic or recurrent low back pain, physically active [n=39]	Pilates exercise versus no change in physical activity ^b	Numerical Rating Scale (101 point)	4 weeks	-15.6 [-17.8 to -13.4] ^a

^astatistically significant between group difference;
[†]reported as statistically significant in study, but not calculated in this review;
^bwith or without usual care.
 doi:10.1371/journal.pone.0100402.t006

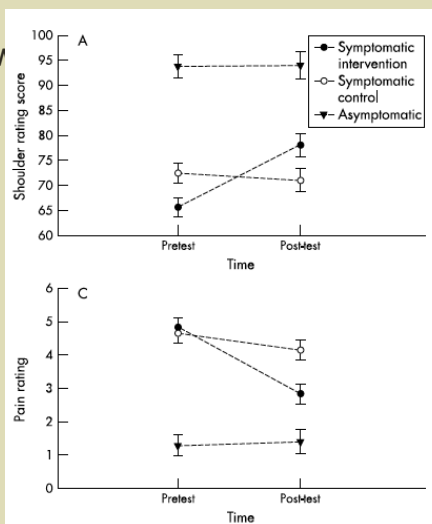
PLoS One 9:7, e100402

Effects of a home exercise programme on shoulder pain and functional status in construction workers

P M Ludewig, J D Borstad



Construction workers
 exercise



Occup Environ Med 60:841, 2003

Enhanced pain modulation among triathletes: A possible explanation for their exceptional capabilities

Nirit Geva, Ruth Defrin*

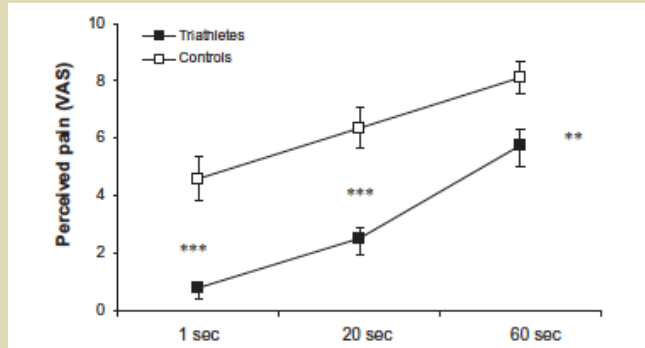
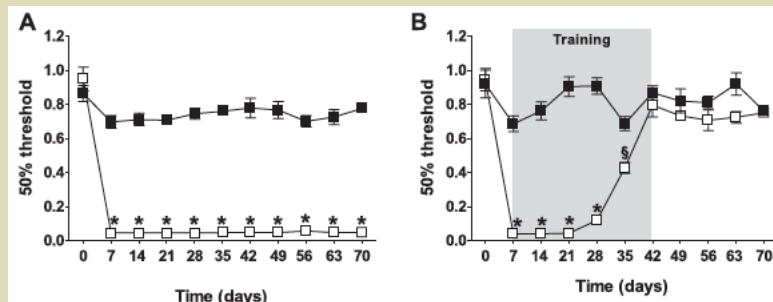


Fig. 4. Ratings of tonic noxious cold stimulus with time in triathletes and controls. Perceived pain was significantly lower in triathletes than in controls at all 3 time points (** $P < .01$, *** $P < .001$). The increase in perceived pain with time was similar for both groups. Values denote mean \pm SD. VAS = visual analog scale.

Pain 154:2317, 2013

Exercise therapy normalizes BDNF upregulation and glial hyperactivity in a mouse model of neuropathic pain

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Pain 156:504, 2015

