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**VA/DoD Clinical Practice Guideline**  
**Rehabilitation of**  
**Lower-Limb Amputation**

**Clinician Tool Kit**

*Pain Management*  
*Management of Residual Limb*  
*Analysis & Treatment of Abnormal Gait*

# PAIN MANAGEMENT IN LOWER EXTREMITY AMPUTATION

## OVERVIEW

PhAse		PAin Con t Ro L
I.	Preoperative	Assess for existing pain.
II.	Postoperative	Assess and aggressively treat residual and phantom limb pain.
III.	Pre-Prosthetic	Assess for specific treatable causes of residual limb or phantom limb pain and apply specific treatments appropriate to the underlying etiology. If no specific cause can be determined treat with non-narcotic medications and other non-pharmacological, physical, psychological, and mechanical modalities.
IV.	Prosthetic Training	Assess for specific treatable causes of residual limb or phantom limb pain and apply specific treatments appropriate to the underlying etiology. If no specific cause can be determined treat with non-narcotic medications and other non-pharmacological, physical, psychological, and mechanical modalities.
V.	Long-Term Follow-Up	Assess and treat associated musculoskeletal pain that may develop with time.

## PHANTOM LIMB PAIN *Pain distal to the end of the residual limb*

Etiology	Key Historical or Examination Features	Evaluation	Treatment	
			Non-pharmacological	Pharmacologic
Primary Phantom Limb Pain (PLP)	Onset in early post amputation period Often nocturnal Gradually reduced in intensity and frequency over time Can be exacerbated by residual limb pain	Diagnosis of exclusion once other causes of PLP have been ruled out	Desensitization Mirror Therapy Residual limb compressive devices Prosthetic use Transcutaneous electrical stimulation (TENS) Acupuncture Alternative and complementary medicine Mental health evaluation and treatment (Depression & PTSD)	TCA's Anticonvulsants Antispasmodics SSRIs NMDA receptor antagonists
Referred pain from proximal neurological or musculoskeletal source	Consider symptoms of typical musculoskeletal, radicular, and other causes	Imaging as appropriate EMG/Nerve conduction studies	Treat underlying cause as appropriate	Pharmacologic Rx as appropriate
Referred pain from a Neuroma	Aggravated by prosthetic use Local tinel or tenderness at the end of nerve	Diagnostic injection Ultrasound or MRI	Prosthetic modification to reduce mechanical loads Corticosteroid injection Phenol ablation Surgical resection	Consider Pharmacologic Rx if non-responsive to other treatments: • TCA's • Anticonvulsants • Antispasmodics • SSRIs • NMDA receptor antagonists

Pain Management

## PHANTOM LIMB SENSATION *Non-painful sensations distal to the residual limb* *Wide spectrum of sensory experiences that vary in intensity frequency, and severity*

Etiology	Key Historical or Examination Features	Evaluation	Treatment	
			Non-pharmacological	Pharmacologic
If mild and non-functionally limiting	None	None	Educate and Reassure patient	None
If of adequate severity that is perceived as uncomfortable or distressing	Onset in early post amputation period Often nocturnal Gradually reduced in intensity and frequency over time	No specific	Desensitization Mirror therapy Residual limb compressive devices Prosthetic use TENS Acupuncture Alternative and Complementary Medicine	Consider Pharmacologic Rx if non-responsive to other treatments: • TCA's • Anticonvulsants • Antispasmodics • SSRIs • NMDA receptor antagonist

## MUSCULOSKELETAL PAIN

*Amputation has been associated with increased prevalence of secondary musculoskeletal pain in the lumbar spine and in the contralateral knee/hip*

Etiology	Key Historical or Examination Features	Evaluation	Treatment	
			Non-pharmacological	Pharmacologic
Degenerative Arthritis	Exacerbation with increased mobility and mechanical loading	X-ray Include weight-bearing views	Physical Therapy Corticosteroid / Visco-supplementation injections Surgical referral as appropriate	Non-narcotic pain medications
Non-specific low back pain	Exacerbation with ambulation	Imaging and laboratory studies if red flags or persistent symptoms	Physical Therapy	Non-narcotic pain medications

## RESIDUAL LIMB PAIN

*Pain in the limb between the end of the residual limb and the next most proximal joint*

Etiology	Key Historical or Examination Features	Evaluation	Treatment	
			Non-pharmacological	Pharmacologic
Mechanical	Exacerbated by use of the prosthesis Associated with residual limb findings of redness, callous or ulceration	Evaluate prosthetic fit and alignment	Refer to Prosthetist	Non-narcotic pain medications
Neuroma	Pain with prosthetic use Local tinel sign Possible palpable mass	Diagnostic injection Ultrasound or MRI	Prosthetic modification to reduce mechanical loads Corticosteroid injection Phenol ablation Surgical resection	Consider pharmacologic Rx if non-responsive to other treatments: • TCAs • Anticonvulsants • SSRIs • NMDA receptor antagonist
Ischemic	Claudication with ambulation	Vascular evaluation	Treat as appropriate	None
Infection • Cellulitis • Abscess • Osteomyelitis	Classical examination features Unexplained poor glucose control Pain unexplained by other causes	Laboratory evaluation: • WBC • CRP/ESR • Glucose • Imaging studies as appropriate	Treat as appropriate	None
Neuropathic Central (CRPS) Peripheral	Hypersensitivity Autonomic features	Consider Triple Phase Bone Scan	Desensitization Residual limb compressive devices Prosthetic use TENS Acupuncture Alternative and Complementary Medicine Mental health evaluation and treatment (Depression, PTSD)	Consider pharmacologic Rx if non-responsive to other treatments: • TCAs • Anticonvulsants • Antispasmodics • SSRIs • NMDA receptor antagonists

# RESIDUAL LIMB MANAGEMENT

## OVERVIEW

PhAse		CARe MAn Ag e Me nt
I.	Preoperative	<p>Desensitization exercises, skin hygiene, and description of types of pain</p> <p>Explain and differentiate between residual limb pain, phantom pain, and phantom sensation</p>
II.	Postoperative	<p>Donning/doffing of ACE wrap or shrinker if appropriate</p> <p>Desensitization exercises, skin hygiene, and description of types of pain</p>
III.	Pre-Prosthetic	Care of residual limb
IV.	Prosthetic Training	<p>Donning/doffing of prosthetic system</p> <p>Use of shrinker when out of the prosthesis</p> <p>Skin checks and skin hygiene</p> <p>Management of sock ply if appropriate</p> <p>Observe pressure points and protect contralateral foot</p>
V.	Long-Term Follow-Up	Foot care and skin checks

Residual Limb Management

## MANAGEMENT OF RESIDUAL LIMB

Problem	Look for	Assessment/Intervention	Refer to
Skin-Redness	Socket fit Suspension	Assess prosthetic alignment Assess donning technique Assess for proper sock ply Limit wear-time if redness does not resolve in 20 min	Prosthetist for adjustment/ socket fit
Blister	Suspension Socket fit Thermal	Assess donning technique Assess for proper sock ply Assess prosthetic alignment End wear-time	Physician for wound care Prosthetist for adjustment/ socket fit
Rashes	Contact Fungal Bacterial	Instruct pt in Liner hygiene Instruct pt in skin hygiene Assess suspension system	If severe or not resolving, physician referral
Callosity		Identify only	Physician and Prosthetist
Folliculits or Epidermal Cyst		Limit wear-time Instruct pt in liner hygiene Instruct pt in skin hygiene Consider socket modification	Prosthetist Dermatology referral for recalcitrant cases
Shape	Dog ears Bulbous Cylindrical— <i>optimal for TTA</i> Conical— <i>optimal for TFA</i>	Apply ace wrap/compression stocking Apply shrinker Consider custom gel liner Consider socket modification	Prosthetist Therapist (PT/OT)
Volume	Abnormal volume which interferes with prosthetic fit	Review weight control Review positioning Assess sock ply management Apply ace wrap/compression stocking Apply shrinker Consider custom gel liner Consider socket modification	Dietitian Prosthetist PT/OT therapist  If bilateral edema physician
Bursae	Identify	Limit wear-time Modality ice/ultrasound Consider socket modification	Prosthetics If recalcitrant, consider surgical referral
Heterotopic Ossification	Identify	Limit wear-time Possibly NSAID during inflammatory phase Consider socket modification	Prosthetics If recalcitrant, consider surgical referral
Infection	Warmth, erythema, discharge, fever, unexplained pain, poor glucose control	Identify only	Physician
Unstable Bone/Joint	Tibio/fibular Knee	Consider socket /suspension change Consult therapy to stabilize knee	Prosthetics Therapy (PT/OT) If recalcitrant consider referral to ortho
Scar Formation	Excessive Adherent Skin grafts Burns	Consider custom gel liner Perform scar massage Slow, gradual progression of prosthetic use with frequent re-exam	Prosthetics Therapy (PT/OT)  If recalcitrant consider plastics/ orthopedic

# GAIT ANALYSIS

## OVERVIEW

**Observational gait analysis** involves the identification of gait deviations and determination of the causes associated with each deviation. The treatment team can then plan and recommend corrective actions to improve the situation. Clinical team should be familiar with normal gait, biomechanics, and prosthetic fit and alignment.

Component Parts		Gait Analysis Procedure
I.	Observation	It is essential to observe from at least two vantage points. Sagittal-plane motions are best seen from the side, while frontal-plane motions are best seen from the front or rear.
II.	Identification of gait abnormalities	Abnormalities are defined as any gait characteristic that differs from the normal pattern. Keep in mind that the single most outstanding characteristic of the normal pattern is symmetry. Thus, for the unilateral amputee deviations are often identified by observing asymmetry, that is, differences in the patterns of the prosthetic and normal sides.
III.	Determination of causes	The obvious place to look is at the prosthesis, as there are many prosthetic causes for gait deviations. However, there are many non-prosthetic causes. The individual patient may have restricted range of motion at one or more joints, muscular weakness, concomitant medical conditions, excessive fear, or old habit patterns, any of which may cause deviant gait.
		<b>Analyze the prosthesis, but do not ignore the patient!</b>

Gait Abnormalities

# GAIT ANALYSIS – ABNORMALITIES IN TRANSTIBIAL AMPUTATION

Gait Abnormality	Patient Related			Prosthetic Related	
	Possible Causes	Additional Evaluation	Interventions	Prosthetic Causes	Additional Evaluation
<b>1. Vaulting</b>  An attempt to lengthen the stance phase on the intact limb by knee extension and ankle plantar flexion during mid stance phase	Inability to adequately flex the knee on the prosthetic side	Test knee ROM (all other causes are excluded)	Step-ups with prosthetic leg	Prosthetic limb too long	Evaluate pelvic height in standing with equal weight through both limbs
	Habit gait pattern	None	Repetitive Step forward-step back with prosthetic leg (sound leg remains stationary)	Poorly suspended prosthesis	Evaluate pistoning and/or a socket that is too loose
				Excessive ankle plantar flexion of the prosthetic foot	Posterior leaning prosthesis when observed off of the patient
<b>2. Circumduction</b>  The prosthetic limb travels in an a lateral arch during swing phase	Inability to adequately flex the knee on the prosthetic side	Test knee ROM	Step-ups with prosthetic leg	Prosthetic limb too long	Evaluate pelvic height in standing with equal weight through both limbs
	Habit Gait Pattern	None	Repetitive Step forward-step back with prosthetic leg (sound leg remains stationary)	Poorly suspended prosthesis	Evaluate pistoning and/or a socket that is too loose
	Weak hip flexors	Perform manual muscle test	Traditional exercises for hip strengthening	Excessive ankle plantar flexion of the prosthetic foot	Posterior leaning prosthesis when observed off of the patient
<b>3. Abducted Gait Pattern</b>  The prosthetic limb is carried in an abducted position throughout the swing and stance phase	Adaptation for medial compartment knee pain	Knee joint evaluation	Weight shifting activities over prosthetic limb	Outset prosthetic foot can give an apparent abducted gait pattern	Evaluate iliac crest height in standing
	Adaptation for focal residual limb pain	Inspect residual limb integrity	Refer for management of residual limb problems	Prosthesis is too long	Evaluate iliac crest height in standing
	Balance impairment/ Fear of falling	Evaluate balance and stability	Advanced balance activities	Medially placed foot	Evaluate static prosthetic alignment
<b>4. Knee instability</b>  Excessive knee flexion on prosthetic side in early stance	Knee flexion contracture	Test knee ROM	Stretch accordingly	Excessive foot dorsiflexion	Evaluate static prosthetic alignment
	Quad weakness	Perform manual muscle test	Closed chain strengthening exercises while wearing prosthesis	Excessive socket flexion	Evaluate static prosthetic alignment
				Posterior translation of the foot/ pylon	Evaluate static prosthetic alignment assess heel
				Excessively hard heel cushion or prosthetic heel keel	Evaluate compression during manual loading
<b>5. Genu Recurvatum</b>  The knee on the prosthetic side hyperextends during mid to late stance phase	Inadequate knee flexion range of motion	Test knee ROM	Stretch accordingly	Excessively compliant prosthetic heel cushion or too rigid forefoot keel	Assess heel compression during manual loading
	Quad weakness	Perform manual muscle test	Closed chain strengthening exercises while wearing prosthesis	Inadequate socket flexion	Evaluate static prosthetic alignment
	Hip flexion contracture	Test hip ROM	Stretch accordingly	Excessively plantar flexion of the prosthetic foot	Evaluate static prosthetic alignment
				Anterior translation of prosthetic foot/pylon	Evaluate static prosthetic alignment

# GAIT ANALYSIS – ABNORMALITIES IN TRANSTIBIAL AMPUTATION

Gait Abnormality	Patient Related			Prosthetic Related	
	Possible Causes	Additional Evaluation	Interventions	Prosthetic Causes	Additional Evaluation
<b>6. Reduced Toe Clearance</b> Prosthetic toe drags or catches during swing phase	Muscle weakness of the hip and/or knee flexors	Perform manual muscle test	Knee flexion plus bridging with ball Traditional exercises	Prosthetic limb too long	Evaluate iliac crest heights in standing with equal weight bearing on the prosthetic limb
	Reduced range of motion in hip flexion or knee flexion	Test ROM	Stretch accordingly	Inadequate suspension/pistoning	Evaluate adequacy of suspension
	Contralateral hip abductor weakness	Perform manual muscle test	Sidestepping with prosthesis with or without the Theraband Traditional exercises	Residual limb not getting into prosthetic socket all the way  Excessive plantar flexion of the prosthetic foot	Evaluate the relationship of the residual limb to the distal end of the prosthetic socket  Evaluate static alignment of the prosthetic limb
<b>7. Excessive valgus moment at the knee</b> Abnormal valgus moment at the knee of the residual limb during prosthetic stance phase	Short residual limb may cause poor stabilization of the prosthetic socket	Evaluate residual limb length in conjunction with adequacy of socket fit	No intervention for structural deformity	Excessive lateral translation of the prosthetic pylon/foot	Evaluate static prosthetic alignment
	Ligamentous instability may contribute to this abnormality	Evaluate ligament integrity using typical manual testing techniques	None	Excessive valgus angulation at the prosthetic socket pylon junction	Evaluate static prosthetic alignment
<b>8. Decreased prosthetic stance time</b> The total duration of stance phase on the prosthetic limb is reduced	Residual limb pain	Examine residual limb to identify source of pain	Appropriate modality for pain and gait training	Poorly fitting prosthetic socket	Identify possible signs of poor prosthetic socket fit
	Musculoskeletal pain in proximal structures	Musculoskeletal evaluation to identify source of pain	None	Prosthetic foot alignment	Ensure that there are no underlying alignment abnormalities that contribute to a sense of instability
	Reduced confidence in the prosthesis		Forward/back with sound limb (prosthesis stationary)		
	Balance impairment	Evaluate balance function	Advanced balance activities		
<b>9. Pelvic drop</b> The pelvis on the prosthetic side drops on initial contact as if "stepping into a hole"	Contralateral hip abductor weakness	Perform manual muscle test	Sidestepping with prosthesis with or without the theraband Traditional exercises	Prosthetic limb too short	Compare iliac crest heights in standing
				Residual limb has shrunk relative to the socket	Evaluate adequacy of residual limb volume to the socket, and sock ply
				Excessively compliant heel cushion or prosthetic heel	Assess heel compliance during manual loading

Trans tibial Gait Abnormalities

# GAIT ANALYSIS – ABNORMALITIES IN TRANSFEMORAL AMPUTATION

Gait Abnormality	Patient Related			Prosthetic Related		
	Possible Causes	Additional Evaluation	Interventions	Prosthetic Causes	Additional Evaluation	
<b>1. Lateral trunk lean over prosthesis</b>  Trunk bends laterally over the prosthesis (compensated Trendelenberg) during stance	Weak hip abductors	Perform manual muscle test	Side stepping with prosthesis	Inadequate adduction of the socket	Check socket fit	
	Painful residual limb	Examine residual limb to identify source of pain	Appropriate referral	Prosthesis too short	Check length at iliac crest	
	Gait habit	None	Gait retraining	Outset foot	Adjust prosthesis	
	Hip abduction contracture	Assess ROM	Appropriate stretching	Medial wall too high causing pain	Check socket fit	
<b>2. Abducted Gait</b>  Abduction of prosthetic limb with unilateral widened base of support on prosthetic side during stance	Abduction contracture	Assess ROM	Appropriate stretching	Gapping at lateral wall of socket	Evaluate socket fit	
	Weak adductors	Perform manual muscle testing	Side stepping with prosthesis	Prosthesis is too long	Check leg length at iliac crest	
	Fear or habit, or insecurity with knee control		Traditional exercises Weight shifting activities over the prosthesis Gain confidence through increased wear time and gait training	Adductor roll	Medial wall too high	Check fit in full weight bearing
				Outset foot	Assess for proper shrinkage device/ application Evaluate socket fit	
				Improperly aligned pelvic band	Adjust prosthesis	
				Improper relief for proximal medial trim line	Check socket fit	
<b>3. Circumduction of prosthesis</b>  Abduction of the prosthetic limb in swing with to normal base of support in stance	Weak hip flexion	Perform manual muscle test	Traditional exercises Teach proper use of prosthetic knee	Excessive knee friction	Adjust prosthetic knee function	
	Insufficient muscle activation	Perform manual muscle test Biofeedback	Weight shifting activities Rhythmic stabilization on residual limb while standing without prosthesis	Prosthesis too long	Check leg length at iliac crest	
				Foot set in excessive plantar flexion	Evaluate static alignment of prosthetic limb	
	Excessive soft tissue	Assess for proper shrinkage device	Review wrapping technique or use of shrinker	Inadequate suspension	Modify suspension	
	Gait habit		Gait training	Socket too large	Check height/shape of medial brim Check sock ply	

Transfemoral Gait Abnormalities

# GAIT ANALYSIS – ABNORMALITIES IN TRANSFEMORAL AMPUTATION

Gait Abnormality	Patient Related			Prosthetic Related	
	Possible Causes	Additional Evaluation	Interventions	Prosthetic Causes	Additional Evaluation
<b>4. External Rotation of Prosthesis</b>  Toe out on prosthetic side; Knee rotated outward in both swing and stance	Poor residual limb muscle control (decreased stability)	Perform manual muscle tests of hip external rotators and abductors	Strengthen hip external rotators and abductors Resistive gait training	Heel cushion or plantar-flexion bumper is too stiff	Evaluate heel compression during manual loading
	Improperly donned	Evaluate alignment of prosthesis in full weight bearing	Teach proper donning of prosthesis	Too much toe-out	Check static alignment
				Too much heel lever	Check static alignment
				Anterior or medial brim pressure	Evaluate alignment of knee under socket
<b>5. Pelvic Drop Off</b>  Stepping in a hole Initial Contact	Weak abductors on the opposite side	Test strength of opposite abductors	Strengthening exercises	Prosthesis too short	Check leg length at iliac crest
				Excessively compliant prosthetic heel	Assess heel compliance during manual loading
<b>6. Knee Instability (flexion)</b>  Prosthetic knee buckles in stance phase	Weak hip extensors	Test hip extensor strength	Strengthening exercises	Knee axis too far ahead of TKA line	Evaluate static alignment of the prosthesis
	Severe hip flexion contracture	Test hip ROM	Stretching exercises	Insufficient socket flexion	Evaluate alignment while wearing the prosthesis
	Heel height of shoes	Evaluate shoes	Change shoes to proper height	Heel keel or plantar flexion bumper too stiff	Evaluate heel compression during manual loading
	Poor weight shift	Evaluate weight shifts	Weight shifting activities with prosthesis	Too much dorsiflexion Too long heel lever	Check static alignment
<b>7. Increased Knee Extension (terminal impact)</b>  Excessive impact with heel strike in terminal swing	Vigorous hip flexion followed by strong hip extension	Listen to the heel strike	Balance activities Weight shifting activities	Insufficient friction of the prosthetic knee	Adjust prosthetic knee function
	Lack of prosthetic trust	Evaluate balance function	Single limb stance Resistive gait training		
<b>8. Medial/Lateral Whip</b>  Abrupt medial or lateral movement of the prosthetic heel during swing	Improperly donned	Evaluate socket position	Teach proper donning of socket	Excessive external or internal rotation of socket	Evaluate alignment of the knee axis
	Excessive soft tissue	Assess for proper shrinkage device	Review wrapping technique or use of shrinker	Socket too tight	Assess for proper shrinkage device/application Evaluate socket fit
	Insufficient or poor timing of muscular activation	Biofeedback	Rhythmic stabilization at hips	Inadequate suspension	Modify suspension
				Excessive valgus of prosthetic knee	Evaluate static prosthesis alignment

Transfemoral Gait Abnormalities

# GAIT ANALYSIS – ABNORMALITIES IN TRANSFEMORAL AMPUTATION

Gait Abnormality	Patient Related			Prosthetic Related	
	Possible Causes	Additional Evaluation	Interventions	Prosthetic Causes	Additional Evaluation
<b>9. Increased Stride Width</b>  Wide based gait pattern during stance	Poor balance or poor weight-shifting	Check standing balance	Standing balance Weight shift activities	Prosthesis too long	Check leg length at iliac crest
	Hip abduction contracture	Evaluate hip ROM	Stretching exercises	Outset foot	Adjust prosthesis
	Adducted sound limb	Evaluate hip ROM	Stretch adductors and strength abductors	Socket too abducted	Check static alignment
	Gait habit		Gait training	Medial wall pressure Medial leaning pylon	Check static alignment Check static alignment
<b>10. Increased Knee flexion</b> (excessive heel rise)  Heel of prosthesis rises higher than the sound foot in toe off	Strong hip flexors	Test hip extensors strength	Strengthen hip extensors	Insufficient knee friction	Adjust prosthetic knee function
	Hip flexion contracture	Test hip ROM	Stretching exercises		
<b>11. Increased Stride Length</b>  Long prosthetic step (decreased stance time on prosthesis)	Lack of confidence in prosthesis, inadequate weight bearing/shift, poor balance or pain	None	Weight shifting activities over the prosthesis Gain confidence through increased wear time and gait training Balance Exercises	Painful socket	Evaluate socket fit
	Hip flexion contracture on prosthetic side	Evaluate ROM of the hip	Stretching exercises	Prosthesis too long	Check leg length at iliac crest
	Compensate for decreased stride with sound limb	Measure stride length	Resisted walking Theraband exercises Step-ups Training in forward weight shift of hips		
	Knee flexion contracture on sound side	Evaluate Knee ROM	Stretching exercises		
<b>12. Trunk Lordosis</b>  Increased lumbar arch during stance	Tight hip flexors	Evaluate hip ROM	Stretch hips	Insufficient socket flexion	Check TKA line for excessive knee stability
	Weak hip extensors	Check strength of hip	Strengthening exercises	Posterior wall promotes anterior pelvic tilt	Adjust socket
	Weak abdominal muscles	Check abdominal muscles	Core strengthening		
	Gait habit		Gait training		

## GAIT ANALYSIS – ABNORMALITIES IN TRANSFEMORAL AMPUTATION

Gait Abnormality	Patient Related			Prosthetic Related	
	Possible Causes	Additional Evaluation	Interventions	Prosthetic Causes	Additional Evaluation
<b>13. Decreased Toe Clearance</b> Prosthetic toe drags or catches during swing phase	Muscle atrophy	Check hip and knee strength both sides	Strengthening knee exercises	Prosthesis too long	Check leg length at iliac crest
	Improperly donned	Evaluate socket position	Teach proper donning of socket	Pistoning Poor socket fit Change in the residual limb	Observe side view alignment Check socket fit, socket ply, and suspension
	Insufficient pelvic rotation	Evaluate resisted pelvic rotation	Assisted pelvic rotation in parallel bars	Prosthetic foot set in excessive plantar flexion	Evaluate static alignment of prosthetic limb
	Weak hip or knee flexors	Evaluate strength of hip and knee	Strengthening knee and hip exercises		
<b>14. Vaulting</b> Lengthen sound side by rising on toes during stance of sound limb	Fear of not clearing prosthetic toe	None	Weight shifting activities with prosthesis Gain confidence through increased wear time and gait training	Prosthesis too long	Check leg length at iliac crest
	Weak hip flexors	Check hip strength	Stepping practice	Excessive knee friction	Adjust knee function
	Insufficient pelvic rotation	Check appropriately donned socket	Assisted/resisted pelvis rotation exercises	Inadequate suspension/pistoning	Check socket fit, socket ply, and suspension
				Foot set in excessive plantar flexion	Evaluate static alignment of prosthetic limb

Transfemoral Gait Abnormalities