ASSESSMENT AND DIAGNOSIS

Overview

Importance of Pain Assessment

Pain is a significant predictor of morbidity and mortality.

- Screen for red flags requiring immediate investigation and/or referral
- Identify underlying cause
 - Pain is better managed if the underlying causes are determined and addressed
- Recognize type of pain to help guide selection of appropriate therapies for treatment of pain
- Determine baseline pain intensity to future enable assessment of efficacy of treatment

Comprehensive Pain Assessment

Assess effects of pain on patient's function

Characterize pain location, distribution, duration, frequency, quality, precipitants

Complete risk assessment

Take detailed history (e.g., comorbidities, prior treatment)

Conduct physical examination

Clarify etiology, pathophysiology

National Pharmaceutical Council, Joint Commission on Accreditation of Healthcare Organizations. *Pain: Current Understanding of Assessment, Management, and Treatments*. Reston, VA: 2001; Passik SD, Kirsh KL *CNS Drug* 2004; 18(1):13-25.

Assessment of Acute Pain

- Site of pain
- Circumstances associated with pain onset
- Character of pain
- Intensity of pain
- Associated symptoms (e.g., nausea)
- Comorbidities

• Treatment

- Current and previous medications, including dose, frequency of use, efficacy and side effects
- Relevant medical history
 - Prior or coexisting pain conditions and treatment outcomes
 - Prior or coexisting medical conditions
- Factors influencing symptomatic treatment

Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine. *Acute Pain Management: Scientific Evidence.* 3rd ed. ANZCA & FPM; Melbourne, VIC: 2010.



Ayad AE et al. J Int Med Res 2011; 39(4):1123-41.

History

Clinical Assessment of Pain

Functional Assessment

Psychological Assessment

Medication History



Does the pain interfere with activities?

Does the patient have concomitant depression, anxiety, or mental status changes?

Does the patient have sleep disorders or a history of substance abuse/dependence? What medications have been tried in the past?

Which medications have helped?

Which medications have not helped?

Wood S. Assessment of pain. Nursing Times.net 2008. Available at: http://www.nursingtimes.net/nursing-practice/clinical-zones/pain-management/assessment-of-pain/1861174.article. Accessed: October 7, 2013.

Pain History Worksheet

- Site of pain
- What causes or worsens the pain?
- Intensity and character of pain
- Associated symptoms?
- Pain-related impairment in functioning?
- Relevant medical history

Pain Assessment: PQRST Mnemonic

- Provocative and Palliative factors
- Quality
- Region and Radiation
- Severity
- Timing, Treatment

Budassi Sheehy S, Miller Barber J (eds). Emergency Nursing: Principles and Practice. 3rd ed. Mosby; St. Louis, MO: 1992.

Assessing Acute Pain

Pain Intensity

- Visual analog scale (VAS)
 - Self-rating on a 0–100 mm scale
- Numerical rating scale
 - Self-rating on a 11-point scale:0 = no pain to 10 = worst pain
- Time-specific pain intensity
 - "My pain at this time is: none, mild, moderate, severe" (0 to 3 rating)
- Time-specific pain relief
 - "My pain relief at this time is: none, a little, some, a lot, complete" (0 to 4 rating)

Impact of Pain on Function

- American Pain Society (APS) questionnaire
 - The degree to which pain interferes with patient function, such as mood, walking and sleep
- Brief Pain Inventory (BPI)
 - Evaluates severity, impact and impairment on daily living, mood and enjoyment of life

Coll AM et al. J Adv Nursing 2004; 46(2): 124-133; Dihle A et al. J Pain 2006; 7(4):272-80; Keller S et al. Clin J Pain 2004; 20(5):309-18.

Locate the Pain



Body maps are useful for the precise location of pain symptoms and sensory signs.*

*In cases of referred pain, the location of the pain and of the injury or nerve lesion/dysfunction may not be correlated Gilron I *et al. CMAJ* 2006; 175(3):265-75; Walk D *et al. Clin J Pain* 2009; 25(7):632-40.

Determine Pain Intensity



International Association for the Study of Pain. *Faces Pain Scale – Revised*. Available at: <u>http://www.iasp-pain.org/Content/NavigationMenu/GeneralResourceLinks/FacesPainScaleRevised/default.htm</u>. Accessed: July 15, 2013; Iverson RE *et al. Plast Reconstr Surg* 2006; 118(4):1060-9.

APS Questionnaire

- Measures 6 aspects of quality:
 - Pain severity and relief
 - Impact of pain on activity, sleep and negative emotions
 - Side effects of treatment
 - Helpfulness of information about pain treatment
 - Ability to participate in pain treatment decisions
 - Use of non-pharmacological strategies

Brief Pain Inventory

FORM 3.2 Brief Pain Inventory

Date	//	Time	·
Name:			
	Last	First	Middle Initial
1) Theorem	hout our lives	most of us he	in had pain

- Inroughout our ivves, most of us nave nad pain from time to time (such as minor headaches, sprains, and toothaches). Have you had pain other than these everyday kinds of pain today?
 Yes 2. No
- On the diagram shade in the areas where you feel pain. Put an X on the area that hurts the most.



- 3) Please rate your pain by circling the one number that best describes your pain at its worst in the past 24 hours.
 0 1 2 3 4 5 6 7 8 9 10
- No pain as bad as pain you can imagine
- 4) Please rate your pain by circling the one number that best describes your pain at its least in the past 24 hours.
 0 1 2 3 4 5 6 7 8 9 10
- No pain as bad as pain you can imagine

5) Please rate your pain by circling the one number that best describes your pain on the **average** 0 1 2 3 4 5 6 7 8 9 10 No pain as bad as pain you can imagine

 6) Please rate your pain by circling the one number that tells how much pain you have **right now**.

 0
 1
 2
 3
 4
 5
 6
 7
 8
 9
 10

 No
 pain as bad as pain you can imagine you can imagine

- 7) What treatments or medications are you receiving for your pain?
- 8) In the Past 24 hours, how much relief have pain treatments or medications provided? Please circle the one percentage that most shows how much releif you have received 0% 10 20 30 40 50 60 70 80 90 100%

No Complete relief

 Circle the one number that describes how, during the past 24 hours, pain has interfered with your: A. General activity

0	1	2	3	4	-5	6	7	8	9	10
Do	es n	ot						C	ompl	etely
int	erfer	ne							inter	feres

B. Mood

0 1 2 3 4 5 6 7 8 9 10 Does not Completely interfere interferes

C. Walking ability

0 1 2 3 4 5 6 7 8 9 10 Does not Completely interfere interferes

D. Normal work (includes both work outside the home and housework

0 1 2 3 4 5 6 7 8 9 10 Does not Completely interfere

E. Relations with other people

)	1	2	3	4	- 5	6	7	8	9	10
00	es n	ot						C	ompl	etely
nte	erfei	re							inter	feres

F. Sleep

0	1	2	3	4	5	6	7	8	9	10
Do	es n	ot						C	ompl	etely
int	erfe	re							inter	fere

G. Enjoyment of life

0	1	2	3	4	5	6	7	8	9	10
Do	es n	ot						C	ompl	etely
int	erfei	ne							inter	fere

Cleeland CS, Ryan KM. Ann Acad Med Singapore 1994; 23(2):129-38.

McGill Pain Questionnaire

1 flickering	11 tiring	PPI	Commente	
quivering	exhausting		Comments	
pulsing	12 sickening			
throbbing	suffocating			
beating	13 fearful			
pounding	frightful			
2 jumping	terrifying			-
flashing	14 punishing	126		57
shooting	aruelling			47
3 pricking	cruel		~	25
boring	vicious		-)	(.)
drilling	killing	11-	+11	1.141
stabbing	15 wretched		11	110-11
lancinating	blinding	-) ()	11	10 11
4 sharp	16 annoving	- /// •	0)	11 1
cutting	troublesome		11	
lacerating	miserable	- LI V	112	11-4-11
5 pinching	intense	451 1	1 Vin Gin	
pressing	unbearable		1 400 440	101
anawing	17 spreading		1	1 V S
cramping	radiating		(1-A-1
crushing	nenetrating	- / 1	1	1-10-1
6 tugging	periodaling	- 11	1	- (1)
oulling	18 tight		/ constant	
wrenching	numh		periodic	- \[[[
7 hot	drawing	-)))	brief	hin
burning	equaezing	- LA.	1	1411
coolding	topring			00
scalung	19 cool	-		
9 tipoling	cold	accompanying	Sleen	Food intake
itchy	freezing	symptoms:	good	good
emerting	20 pagging	neusee	fitful -	some
etinging	nausaating	headache -	can't clean	little -
9 dull	aconizing	dizziness	Commente	none -
	dreadful	droweinees -	_ Continuento:	Comments:
burting	torturing	constination	-	Sommenta.
aching .	PPI	diarrhea	-	
bonny .	0 no nain	Commente	Activity	Comments:
10 tender	t mild	onments.	accivity.	comments:
to tender		-	9000 -	-
taut	2 discomforting	-	some -	-
rasping	3 distressing		incue -	-
splitting	4 homble	_	none _	-
	5 excruciating			

Melzack R. Pain 1975; 1(3):277-99.

Physical Examination

Acute Neck Pain: Physical Examination

- Physical examination does not provide a patho-anatomic diagnosis of acute idiopathic or whiplash-associated neck pain as clinical tests have poor reliability and lack validity
- Despite limitations, physical examination is an opportunity to identify features of potentially serious conditions
- Tenderness and restricted cervical range of movement correlate well with the presence of neck pain, confirming a local cause for the pain

Ariens GAM *et al.* In: Crombie IK (ed). *Epidemiology of Pain.* IASP Press; Seattle, WA: 1999; Australian Acute Musculoskeletal Pain Guidelines Group. *Evidence-Based Management of Acute Musculoskeletal Pain. A Guide for Clinicians.* Australian Academic Press Pty. Lts; Bowen Hills, QLD: 2004.

Acute Shoulder Pain: Physical Examination

- Inspection
- Palpation
- Range of motion as compared to unaffected side
- Strength assessment
- Provocative shoulder testing for possible impingement syndrome and glenohumeral instability

Findings of shoulder examination must be interpreted cautiously in light of evidence of limited utility.However, physical examination is an opportunity to identify features of potentially serious conditions.

Australian Acute Musculoskeletal Pain Guidelines Group. *Evidence-Based Management of Acute Musculoskeletal Pain. A Guide for Clinicians.* Australian Academic Press Pty. Lts; Bowen Hills, QLD: 2004; Woodward TW, Best TM. *Am Fam Physician* 2000; 61(10):3079-88.

Shoulder Evaluation Tests

Test	Maneuver	Diagnosis suggested by positive result
Apley scratch test	Patient touches superior and inferior aspects of opposite scapula	Loss of range of motion: rotator cuff problem
Neer's sign	Arm in full flexion	Subacromial impingement
Hawkins' test	Forward flexion of the shoulder to 90 degrees and internal rotation	Supraspinatus tendon impingement
Drop-arm test	Arm lowered slowly to waist	Rotator cuff tear
Cross-arm test	Forward elevation to 90 degrees and active adduction	Acromioclavicular joint arthritis
Spurling's test	Spine extended with head rotated to affected shoulder while axially loaded	Cervical nerve root disorder

Woodward TW et al. Am Fam Physician 2000; 61(10):3079-88.

Shoulder Evaluation Tests (cont'd)

Test	Maneuver	Diagnosis suggested by positive result
Apprehension test	Anterior pressure on the humerus with external rotation	Anterior glenohumeral instability
Relocation test	Posterior force on humerus while externally rotating the arm	Anterior glenohumeral instability
Sulcus sign	Pulling downward on elbow or wrist	Inferior glenohumeral instability
Yergason test	Elbow flexed to 90 degrees with forearm pronated	Biceps tendon instability or tendonitis
Speed's maneuver	Elbow flexed 20 to 30 degrees and forearm supinated	Biceps tendon instability or tendonitis
"Clunk" sign	Rotation of loaded shoulder from extension to forward flexion	Labral disorder

Woodward TW, Best TM. Am Fam Physician 2000; 61(10):3079-88.

Sensitivity and Specificity of Maneuvers Assessing Rotator Cuff Integrity

	Supraspi	inatus	Infraspinatus		Subscapulari	5
	Jobe (empty can)	Full can	Infraspinatus 45° internal rotation	Lift-off	Lift-off push	Bear hug
Sensitivity	44% ¹		42%*	100% ⁺ 18%*		60%*
Specificity	90% ¹		90%*	100%† 100%*		92%*
EMG		Х	Х		Х	

*Partial rupture; [†]Full rupture EMG = electromyogram

Bergeron Y *et al. Pathologie médicale de l'appareil locomoteur*. 2nd ed. Edisem Inc; St. Hyacinthe, QC: 2008; Barth JR *et al. Arthroscopy* 2006; 22(10):1076-84.

Acute Knee Pain: Physical Examination

- Compare painful and asymptomatic knees
- Palpate
- Check for pain, warmth, effusion and point tenderness
- Assess range of motion
- Perform physical maneuvers

Although examination techniques lack specificity for diagnosing knee disorders, physical examination may assist the identification of serious conditions underlying pain.

Australian Acute Musculoskeletal Pain Guidelines Group. *Evidence-Based Management of Acute Musculoskeletal Pain. A Guide for Clinicians.* Australian Academic Press Pty. Lts; Bowen Hills, QLD: 2004; Ebell MJ. *Am Fam Physician* 2005; 71(6):1169-72.

Accuracy of Physical Exam Maneuvers for Diagnosis of Knee Injury

			Probability of specific injury if examination maneuver is:†			
Maneuver	Positive LR*	Negative LR*	Positive (%)	Negative (%)		
ACL tears						
Lachman test	12.4	0.14	58	2		
Anterior drawer test	3.7	0.6	29	6		
Pivot test	20.3	0.4	69	4		
Meniscal injury						
Joint line tenderness	1.1	0.8	11	8		
McMurray test	17.3	0.5	66	5		

*The likelihood ratio is a measure of how well a positive test rules in disease or a negative test rules out disease †Given an overall likelihood of each injury of 10%; if clinical suspicion is higher or lower than this 10% pretest probability, then the probability would be correspondingly higher or lower Jackson JL et al. Ann Intern Med 2003; 139(7):575-88.

Imaging and Other Tests

Investigations for Potential Serious Causes of Acute Neck Pain

Suspected condition	CRP	ESR	FBC	IEPG	MRA	MRI	PSA	Serum protein electrophoresis	X-ray
Fracture									Х
Infection									
All cases	Х	Х	Х						
Spinal						Х			
Tumor									
All cases		1 st line	1 st line			2 nd line			
Myeloma				Х				Х	
Prostate							Х		
Aneurysm					Х				

CRP = C-reactive protein; ESR = erythrocyte sedimentation rate; FBC = full blood count; IEPG = immuno-electrophoretogram; MRA = magnetic resonance angiography; MRI = magnetic resonance imaging; PSA = prostate-specific antigen Australian Acute Musculoskeletal Pain Guidelines Group, Evidence-Based Management of Acute Musculoskeletal Pain, A Guide for Clinicians

Australian Acute Musculoskeletal Pain Guidelines Group. *Evidence-Based Management of Acute Musculoskeletal Pain. A Guide for Clinicians.* Australian Academic Press Pty. Lts; Bowen Hills, QLD: 2004.

Canadian C-Spine Rule



Acute Neck Pain: When to Order CT

- X-ray results:
 - Positive
 - Suspicious
 - Inadequate
 - Suggest injury at the occiput to C2 levels
- Neurological signs or symptoms are present
- Severe head injury
- Severe injury with signs of lower cranial nerve injury or pain and tenderness in the sub-occipital region

CT = computed tomography

Australian Acute Musculoskeletal Pain Guidelines Group. *Evidence-Based Management of Acute Musculoskeletal Pain. A Guide for Clinicians.* Australian Academic Press Pty. Lts; Bowen Hills, QLD: 2004.

Investigations for Potential Serious Causes of Acute Shoulder or Knee Pain

Suspected condition	Aspiration/ microscopy	CRP	ESR	FBC	IEPG	MRI	Serum protein electrophoresis	X-ray
Fracture								Х
Infection								
All cases		Х	Х	Х				
Osteomyelitis						Х		
Joint	Х							
Tumor								
All cases			1 st line	1 st line		2 nd line		
Myeloma					Х		Х	
Crystal arthritis	Х							
Osteonecrosis						Х		

CRP = C-reactive protein; ESR = erythrocyte sedimentation rate; FBC = full blood count;

IEPG = immuno-electrophoretogram; MRI = magnetic resonance imaging

Australian Acute Musculoskeletal Pain Guidelines Group. *Evidence-Based Management of Acute Musculoskeletal Pain. A Guide for Clinicians.* Australian Academic Press Pty. Lts; Bowen Hills, QLD: 2004.

Knee Pain: When to X-ray

	Bauer	Ottawa	Pittsburgh
Rule	 Inability to bear weight AND Presence of an effusion or an ecchymosis 	 ANY ≥1 of: Age ≥55 Isolated tenderness of patella Tenderness at head of fibula Inability to flex to 90° Inability to bear weight 	 History of fall or blunt trauma AND ≥1 of: Age <12 Age >50 Cannot walk 4 weight-bearing steps
Sensitivity	100%	97%	99%
Specificity	100%	27%	60%
Likelihood ratio	-	1.3%	2.5

Bauer SJ et al. J Emerg Med 1995; 13(5): 611-5; Seaberg DC et al. Am J Emerg Med 1994; 12(5):541-3; Stiell IG et al. JAMA 1996; 275(8): 611-5.

Knee Pain: When to Order CT and Ultrasound

СТ

 Suspected fracture and normal X-ray results

Ultrasound

 Swelling or potential rupture of anterior knee structures

CT = computed tomography

Australian Acute Musculoskeletal Pain Guidelines Group. *Evidence-Based Management of Acute Musculoskeletal Pain. A Guide for Clinicians.* Australian Academic Press Pty. Lts; Bowen Hills, QLD: 2004.

Diagnosis

Differential Diagnosis of Knee Pain

Anterior knee pain

- Patellar subluxation or dislocation
- Tibial apophysitis (Osgood-Schlatter lesion)
- Jumper's knee (patellar tendonitis)
- Patellofemoral pain syndrome (chondromalacia patellae)

Lateral knee pain

- Lateral collateral ligament sprain
- Lateral meniscal tear
- Iliotibial band tendonitis



Medial knee pain

- Medial collateral ligament sprain
- Medial meniscal tear
- Pes anserine bursitis
- Medial plica syndrome

Posterior knee pain

- Popliteal cyst (Baker's cyst)
- Posterior cruciate ligament injury

Diagnosis of Shoulder Pain

Key Findings in the History and Physical Examination				
Finding	Probable diagnosis			
Scapular winging, trauma, recent viral illness	Serratus anterior or trapezius dysfunction			
Seizure and inability to passively or actively rotate affected arm externally	Posterior shoulder dislocation			
Supraspinatus/infraspinatus wasting	Rotator cuff tear; suprascapular nerve entrapment			
Pain radiating below elbow; decreased cervical range of motion	Cervical disc disease			
Shoulder pain in throwing athletes; anterior glenohumeral joint pain and impingement	Glenohumeral joint instability			
Pain or "clunking" sound with overhead motion	Labral disorder			
Nighttime shoulder pain	Impingement			
Generalized ligamentous laxity	Multidirectional instability			

Woodward TW et al. Am Fam Physician 2000; 61(10):3079-88.



Look for Red Flags for Musculoskeletal Pain

- Older age with new symptom onset
- Night pain
- Fever

- Sweating
- Neurological features
- Previous history of malignancy

Acute Neck, Shoulder and Knee Pain: Red Flags

Feature or risk factor		Condition
•	Symptoms and signs of infection Risk factors for infection Signs of inflammation in knee	Infection
•	History of trauma Use of corticosteroids with neck or knee pain Sudden onset of pain in shoulder	Fracture, shoulder dislocation, tendon and ligament rupture or osteonecrosis in knee
• • • •	Past history of malignancy Age >50 years Failure to improve with treatment Unexplained weight loss Dysphagia, headache, vomiting with neck pain Pain at multiple sites Shoulder or knee pain at rest Night pain in knee	Tumor

Australian Acute Musculoskeletal Pain Guidelines Group. *Evidence-Based Management of Acute Musculoskeletal Pain. A Guide for Clinicians.* Australian Academic Press Pty. Lts; Bowen Hills, QLD: 2004.

Additional Red Flags: Acute Neck Pain



Australian Acute Musculoskeletal Pain Guidelines Group. *Evidence-Based Management of Acute Musculoskeletal Pain. A Guide for Clinicians.* Australian Academic Press Pty. Lts; Bowen Hills, QLD: 2004.

Summary

Assessment and Diagnosis of Acute Pain: Summary

- Comprehensive assessment and pain history is important in patients presenting with acute pain
- Clinicians should be keep high degree of awareness for "red flags" indicating potential serious disorders
- Although examination techniques lack specificity for diagnosing causes of musculoskeletal pain, physical examination may assist the identification of serious conditions underlying pain
- Imaging is indicated mainly when a serious condition is suspected