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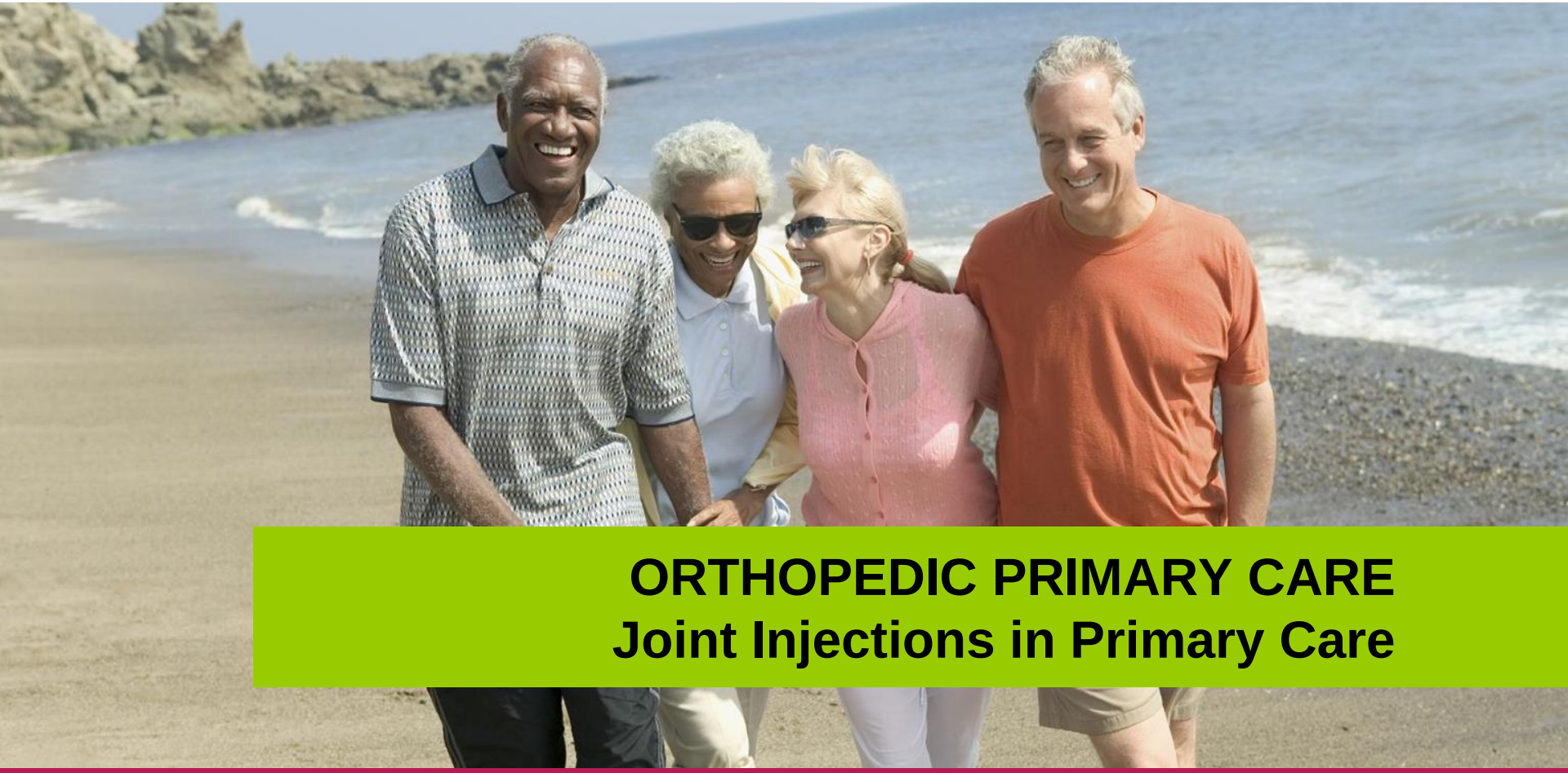

ORTHOPEDIC PRIMARY CARE
Joint Injections in Primary Care

Jackson Orthopaedic Foundation

Joint Injections in Primary Care

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CONFLICT OF INTEREST

We hereby certify that, to the best of our knowledge, no aspect of our current personal or professional situation might reasonably be expected to affect significantly our views on the subject on which we are presenting.

Acknowledgement

This lecture was originally developed as part of ***Orthopedic Primary Care,*** a six-month continuing education program presented yearly by the **Jackson Orthopaedic Foundation,** a non-profit organization in Oakland, California.

More information at:

OrthoPrimaryCare.Info

OBJECTIVES

Upon completion of course, the participants will be able to:

1. **Integrate underlying principles, indications and contraindications with the performance of intra-articular injections**

2. **Design and implement comprehensive evidence-based treatment plans involving joint injections for common acute and chronic musculoskeletal conditions**

3. **Generate appropriate and completely documented joint injection health care plans for collaborative follow up care**

OBJECTIVES (cont.)

4. Create individualized musculoskeletal patient education plans, including principles of coaching, self-managed care, pain management, and prevention of disease progression and injury, associated with joint injections.

5. Distinguish absolute contraindications to joint injections seen in the primary care setting and determine when orthopedic referral should be considered.

OBJECTIVES (cont.)

6. Compare and contrast the available systematic evidence for optimal dose and medication selection for therapeutic joint injections. The use and effects of the following pharmaceutical types will be discussed:

   a. Intraarticular corticosteroids: methylprednisolone acetate triamcinolone hexacetonide, triamcinolone acetonide, betamethasone acetate, and betamethasone sodium phosphate

   b. Local anesthetic agents for intraarticular injection: lidocaine and bupivacaine

COMMON REASONS FOR INJECTIONS

* **Evacuation of painful effusion (arthrocentesis)**
* **Diagnosis of unexplained effusion**
* **Injection of corticosteroid**
* **Local anesthesia (pain management)**
* **Viscosupplementation**

CONTRAINDICATIONS TO JOINT INJECTIONS AND ASPIRATIONS

* Cellulitis or skin breakdown
* Severe primary coagulopathy
* Anticoagulant therapy not well-controlled
* Previously replaced joints
* Purulent fluid aspiration or suspected joint infection

INJECTABLE SOLUTIONS

Little systematic evidence exists for selection

Literature supports using corticosteroid agent which best meets patients' needs and clinical response

Little agreement exists among providers regarding optimal dose and medication selection

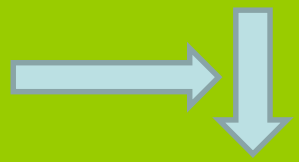
INJECTABLE SOLUTIONS

Frequency of injection & type of medication used is guided by goal of procedure.

Evidence-based research supports safety and efficacy of long-term intraarticular (IA) steroid injections into knees for treatment of symptomatic osteoarthritis.

With notable exception of De Quervain's tenosynovitis, evidence for shoulders, hips, elbows, & hands is less compelling.

PHYSIOLOGY OF CORTICOSTEROID

IA corticosteroid  **inflammation & pain:**

* **reduces synovial blood flow**
* **alters local collagen synthesis**
* **lowers local leukocyte & inflammatory modulator response**

CLINICAL EVIDENCE

* **Systemic absorption**
* **Affect on adrenal function**
* **Local soft tissue damage**
* **Frequency and type of solutions**

COMPLICATIONS

Table 1. Complications of Corticosteroid Injections[15,28-30]

Complication	Incidence (%)
Joint effects	
Postinjection flare	2-15
Steroid arthropathy	0.8
Joint infection	< 0.001-0.072
Surrounding tissue effects	
Pericapsular calcification	43
Tendon rupture	< 1
Skin atrophy/depigmentation	< 1
Systemic effects	
Facial flushing	1-12

The Journal for Nurse Practitioners - JNP 969

COMMONLY USED SOLUTIONS

Table 2. Corticosteroid Solutions for Intraarticular Injection

Corticosteroid	Concentration (mg/mL)	Solubility (mg/L at 25°C)	Duration of Action (approx. hours)
Methylprednisolone acetate	20, 40, 80	120 (intermediate)	12-36+
Triamcinolone acetonide	40	80 (intermediate)	18-36+
Betamethasone acetate	6	58 (low)	36-54+
Betamethasone sodium phosphate	6	30 (low)	
Triamcinolone hexacetonide	20	80 (intermediate)	18-36++

+ may last longer.

++ likely to last longer.

VISCOSUPPLEMENTATION
(HYALURONIC ACID)

* Approved for knee OA in the US

* AAOS Clinical Guidelines not able to recommend, based on 14 reviewed studies

*Provides another treatment modality prior to surgery

LOCAL ANESTHETIC AGENTS

Table 3. Local Anesthetic Agents for Intraarticular Injection

Medication	Onset of Action (min)	Duration of Action (h)	Maximum Volume of Injection
1% lidocaine	1-2	1	20 mL
2% lidocaine	1-2	1	10 mL
0.25% bupivacaine	30	8	60 mL
0.5% bupivacaine	30	8	30 mL

PATIENT INSTRUCTIONS

Table 4. Recommended Instructions for Intraarticular Injection Aftercare

Procedure performed: _____
Patient diagnosis: _____
Instructions:

Pain management: Numbing effect of the lidocaine/Marcaine will wear off after approximately 1 hour. Pain relief from the corticosteroid usually occurs within approximately 24-48 hours. You can expect the pain to return after an hour but to be relieved in 1-2 days.
Rest: Since you will not feel the pain initially, be cautious about activity with the affected joint. You could injure yourself further while the numbing medicine is still in effect. Be careful about your activities for the next couple weeks.
Be alert for signs & symptoms of infection: Precautions have been taken to avoid complications such as infection, but call our office if any of the following symptoms develop:

Fever above 100 degrees
Increased warmth in the area
Redness at the injection site
Redness moving up the arm or leg
Swelling of the area

Follow all of these additional instructions (any that are checked):

___ Apply ice to the area every 4 hours for 20 minutes at a time for 2 days
___ Apply an elastic compression wrap to the area for ___ days
___ Apply a heating pad to the area every 4 hours for 20 minutes at a time for ___ days
___ Perform stretching exercises as instructed
___ Wear a splint to the area for ___ day(s)
___ Physical therapy referral
___ Take the following medicines in addition to your usual medications:

_____
_____
_____
_____

Return for follow-up appointment as scheduled on: _____

Source: Modified from McNabb.[27] A Practical Guide to Joint & Soft Tissue Injection & Aspiration. Philadelphia, Pa: Lippincott Williams & Wilkins; 2005.

TECHNIQUE: INJECTION & ASPIRATION

* Skin preparation
* Needle approach
* Use of ultrasound
* Arthrocentesis
* Frequency of injection
* Equipment
* Complications

Injection Techniques

DEMONSTRATION & RETURN DEMONSTRATIONS:

use of videos, live demos w/ models, and return demonstrations

Hip: Trochanteric Bursa

[Video]

Shoulder: Subacromial Bursa

[Video]

Glenohumeral Joint

[live demo w/model]

Knee: Tibiofemoral joint space

[Video]

Aspiration Technique

DEMONSTRATION & RETURN DEMONSTRATIONS:

use of videos, live demos w/ models, and return demonstrations

[Video]

CASE STUDIES

- **Knee osteoarthritis**
- **Prepatellar bursitis**
- **Trochanteric bursitis**
- **Shoulder impingement**
- **Subacromial bursitis**
- **Rotator cuff disorders**

References

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