Therapy for new-onset atrial fibrillation with rapid ventricular rate

Bottom line
Intravenous (IV) non-dihydropyridine calcium-channel blockers (verapamil and diltiazem) and most IV beta-blockers rapidly reduce the ventricular response in new-onset atrial fibrillation. Although the absolute decrease in heart rate is greater with diltiazem than with metoprolol in the first 20 minutes, the clinical importance of this difference is unclear.

Evidence is limited to support the effectiveness of IV magnesium sulfate and oral clonidine. Compared with IV verapamil, IV magnesium sulfate appears less effective in the first 30 minutes. Oral clonidine may be as effective as IV verapamil, but only after several hours into therapy.

Digoxin is not longer recommended as a primary agent for rate control, because it is not effective during exertion.

Evidence summary
Meta-analysis
A 2003 systematic review identified 54 small heterogenous trials using 17 agents for rate control in patients with acute and chronic atrial fibrillation, with follow-up periods ranging from 15 minutes to 8 weeks. In 8 studies, non-dihydropyridine calcium-channel blockers (verapamil or diltiazem) were compared with digoxin or placebo. The calcium-channel blockers were more effective reducing the ventricular rate both at rest and during exercise. Seven trials assessed atenolol, metoprolol, timolol, pindolol, or nadolol versus placebo, and the active agents were all found to be effective, both at rest and during exercise. Several other beta-blockers, namely xamoterol, celiprolol, and labetalol, were effective with exertion but not at rest. Seven studies compared digoxin with placebo. The effect of digoxin was found to be inconsistent and did not offer adequate rate control during exertion.

Diltiazem vs metoprolol
A prospective, double-blinded clinical trial directly compared IV administration of diltiazem or metoprolol in 40 adult patients presenting to an emergency department with atrial fibrillation and rapid
ventricular response (ventricular rate ≥120 bpm). Patients received either IV diltiazem 0.25 mg/kg (max 25 mg) or IV metoprolol 0.15 mg/kg (max 10 mg) over 2 minutes. The baseline heart rate was 156 bpm in the diltiazem group and 152 bpm in the metoprolol group. At 2, 5, 10, 15, and 20 minutes after infusion, the mean heart rate was 116, 108, 103, 102, and 100 bpm, respectively, in the diltiazem group and 124, 120, 115, 112, and 107 bpm, respectively, in the metoprolol group. At 20 minutes, there was an average 36% decrease in heart rate with diltiazem and a 29% decrease with metoprolol (P<.05). Also at 20 minutes, the mean blood pressure declined 15/10 mmHg with diltiazem and 22/11 mmHg with metoprolol (P>.05).

**Magnesium sulfate**

A meta-analysis of magnesium sulfate for rate-control included both placebo-controlled studies and studies of magnesium sulfate versus other agents (verapamil, amiodarone, ajmaline). Magnesium was more effective than placebo (3 trials with 258 patients) in achieving a heart rate of less than 100 bpm (OR 2.97; 95% CI, 1.78–4.97; NNT=4). One study compared magnesium sulfate with verapamil for rate control in 45 patients. Verapamil more effectively achieved acute rate control than magnesium in the first 30 minutes (OR 4.55; 95% CI, 1.2–16.6). Another study directly compared magnesium sulfate and diltiazem in 46 patients and found no significant difference in rate control.

**Clonidine**

One RCT evaluating the effectiveness of clonidine randomized 40 patients presenting to an emergency department with new-onset rapid atrial fibrillation to 0.1 mg oral clonidine (repeated at 2 hours if necessary), 1 g IV digoxin over 4 hours, or 2.5 mg IV verapamil. At 6 hours, the mean reduction in heart rate was similar in all treatment groups: 44 bpm with clonidine, 52 bpm with digoxin, and 42 bpm with verapamil (P=.55).

**Recommendations from others**

The American College of Cardiology recommends IV esmolol, metoprolol, propranolol, diltiazem, or verapamil for acute rate control management in patients without an accessory pathway, and no single agent is preferred over another. Older guidelines from the American Academy of Family Physicians and the American College of Physicians recommend atenolol, metoprolol, diltiazem, and verapamil.

The guidelines state that digoxin should be considered a second-line agent because it is effective for rate control only at rest. The guidelines do not discuss the use of magnesium sulfate or clonidine.

**Clinical application**

The application of this information to a clinical setting requires a thorough understanding of the complexities of atrial fibrillation. Occasionally, rapid atrial fibrillation is associated with cardiovascular collapse or evidence of critical tissue hypoperfusion. In such a presentation, an attempt at cardioversion will be more appropriate than an attempt at pharmacological rate control. Any consideration of cardioversion, even in the acute setting, should also prompt a review of the risk of cardiac emboli.

Finally, while consensus is growing in the old debate about rate control versus rhythm control, some patients remain poorly tolerant of atrial fibrillation and, even with good rate control, may choose cardioversion at a later time.
Musculoskeletal Health

Current concepts in conservative management of tennis elbow

Bottom line

Population studies show that the annual incidence of lateral humeral epicondyle tendinopathy (LHET) peaks in the fourth decade of life for men and in the fifth decade of life for women, at a rate of about 1% per year.¹ In a 2002 RCT of multiple LHET treatments, the control arm of the study found that a “wait-and-see” approach had an 83% (49/59) success rate at 52 weeks. “Wait-and-see” was minimal intervention, including only sharing the diagnosis, recommending avoidance of painful activities, and providing dosing for over-the-counter analgesics. Success was defined as a score of 1 or 2 on a 6-point Likert symptoms scale (in which “1” = completely recovered, and “6” = much worse).²

Review of the evidence

Nonsteroidal anti-inflammatory drugs (NSAIDs)

Few studies exist evaluating the efficacy of NSAIDs for the treatment of LHET. One of the only such studies to include a control group enrolled 128 men and women between the ages of 22 and 59 (mean, 44 years). The intervention group was given diclofenac sodium (Voltaren®) 75 mg orally, twice daily for 28 days. The control group was given a placebo. Interestingly, both groups were also placed in long-arm casts for the first 14 days to immobilize the common extensor tendon. Pain was measured using a visual analog scale (VAS) from 0 to 100 mm.

For both groups combined, pain was significantly reduced at 28 days (a decrease of 23 mm on the VAS; 95% CI, 18–28); however, the diclofenac group had almost twice the reduction in reported pain as the control group (30 vs 16 mm, respectively; P = 0.001).³

Counterforce brace and physical therapy

A trial of 180 adults (mean age, 45 years) with clinically diagnosed LHET and no recent LHET treatment randomized participants into 3 groups: counterforce brace therapy, physical therapy (PT), or a combination of both.

The counterforce brace was to be worn during the daytime for 6 weeks. (A counterforce brace is a forearm strap that moves the fulcrum of the common
extensor tendon away from the epicondyle distally, to the site of the brace.) Participants receiving PT had 9 sessions over the 6 weeks. Each PT session included stretching and range-of-motion exercises for the hand and wrist. In addition, each PT session included 7.5 minutes of pulsed ultrasound treatment (thought to enhance blood flow, increase membrane permeability, and alter connective tissue extensibility and nerve conduction) and 5 to 10 minutes of friction massage. In this study also, success was defined as a 1 or 2 on a Likert symptoms scale.

At 52 weeks, the success rates were 85% (58/68), 89% (50/56), and 88% (49/56) for the counterforce brace, the PT, and the combination groups, respectively (all results statistically equivalent).

A study conducted in Belgium evaluated 92 men and women (mean age, 39 years) with chronic LHET. The control group was treated with a PT regimen that included stretching, cryotherapy (ice), and transcutaneous electrical nerve stimulation (Thought to enhance blood flow, increase membrane permeability, and alter connective tissue extensibility and nerve conduction) and 5 to 10 minutes of friction massage. In this study also, success was defined as a 1 or 2 on a Likert symptoms scale.

At 52 weeks, the success rates were 85% (58/68), 89% (50/56), and 88% (49/56) for the counterforce brace, the PT, and the combination groups, respectively (all results statistically equivalent).

One of the only studies to use a control group included 199 patients between the ages of 17 and 70 (mean, 50 years). One group was treated with dexamethasone iontophoresis and the other with placebo iontophoresis. Participants received 6 treatments over 15 days. After 1 month, improvement in pain as noted on a VAS was not statistically different between the treatment and control groups (25 and 20 mm, respectively; P=.25).

Physical therapy and iontophoresis
A recent HelpDesk Answer reviewed both corticosteroid iontophoresis and NSAID iontophoresis. No trials were found that supported the use of iontophoresis for long-term alleviation of pain symptoms associated with LHET.6

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A better physical therapy? Eccentric strengthening
A study conducted in Belgium evaluated 92 men and women (mean age, 39 years) with chronic LHET (mean duration of symptoms, 8 months). The control group was treated with a PT regimen that included stretching, ultrasound treatment, deep friction massage, cryotherapy (ice), and transcutaneous electrical nerve stimulation. In addition to this therapy, the intervention group received an eccentric strengthening program of the muscles involved in wrist extension and forearm supination.

Eccentric contraction occurs when muscle fibers fire as the muscle lengthens (eg, against resistance). Study participants were not randomized. Because manual work, participation in racquet sports, and sex are associated with different LHET outcomes, the authors of this study chose to age-, sex-, and activity-match the participants in the control group with those in the intervention group. Both groups received 3 treatments per week over the 9-week study. A 10-point VAS for pain was used (in which “0” = no pain at all, and “10” = most severe pain).

At baseline, the control group had an average pain of 6.7 (95% CI, 6.3–7.1) and the intervention group had an average pain of 6.9 (95% CI, 6.5–7.3). At the end of 9 weeks of treatment, pain in the control group was 4.3 (95% CI, 3.8–4.8) and pain in the intervention group was 1.2 (95% CI, 1.0–1.4; \(P<.001\)). There was no long-term follow-up.

Conclusion
LHET affects a significant percentage of the population. Several oral analgesics, physical braces, physical therapy activities, and electricity- and ultrasound-based treatment modalities exist for the conservative treatment of LHET. Unfortunately for such a common pathology, few of these treatments have been demonstrated effective in carefully conducted RCTs. However, a recent study of eccentric strengthening did have a favorable short-term outcome, and the method appears promising from a clinical standpoint.

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REFERENCES
5. Garcia AG, Flinchbaugh RT, Gottschalk AW. Is iontophoresis therapy effective for tennis elbow (lateral epicondylitis)? Evidence-Based Practice. 2009; 12(11):11. [LOE 1a]
Is musculoskeletal ultrasound helpful in diagnosing acute meniscal tears?

Evidence-Based Answer

Ultrasound assessment, particularly using real-time spatial compound ultrasound, is effective for ruling out meniscal tears. However, ultrasound is much less effective than MRI for diagnosing a meniscal tear, and may miss other intracapsular lesions. (SOR B, based on small, prospective comparative studies.)

In 2008, a prospective comparative study\(^1\) included 35 patients (20 men and 15 women, mean age 47 years) with suspected meniscal tears who were evaluated in a single orthopedic surgeon’s office. Each patient underwent both ultrasound and MRI prior to arthroscopy, which was the definitive assessment of the knee. At surgery, 22 of the 35 patients had a meniscal tear.

Ultrasound was found to have a sensitivity of 86% (95% CI, 75–97.7), which was identical to the sensitivity of MRI. Conversely, specificity of ultrasound was found to be 69% (95% CI, 54–85), while that of MRI evaluation was 100%. The positive likelihood ratio for ultrasound (LR+) was 2.8 and the negative likelihood ratio (LR−) was 0.2. For MRI, a positive test was 100% confirmed at surgery (LR+ “infinite”), with a LR− of 0.14.\(^1\)

In a recent prospective study,\(^2\) 22 patients (16 women and 6 men, mean age 50.4 years) with 29 meniscal tears seen on MRI were prospectively evaluated by ultrasound and compared with a control group of 53 normal menisci by MRI. The study used 1 musculoskeletal radiologist for ultrasound evaluation, who was blind to patient history and MRI results.

Ultrasound identified 25 of the 29 MRI-identified meniscal tears, generating a sensitivity of 86%. There was concordance between ultrasound and MRI for 45 of the 53 MRI-identified normal menisci, for a specificity of 85%. This gave ultrasound a LR+ of 5.7 and a LR− of 0.16. The MRI also revealed 5 intracapsular lesions (1 partial ACL tear, 3 osteochondral lesions, 1 osteochondritis dissecans), whereas the ultrasound only identified 1 intracapsular lesion (osteochondritis dissecans).\(^2\)

Another prospective study\(^3\) completed in 2009 compared both conventional ultrasound and real-time spatial compound ultrasound (RTSCU) with MRI. RTSCU is a relatively new technique in which sono-graphic information is obtained from several different angles of insonation and combined to produce a single image. Seventy menisci of 35 patients with clinically suspicious meniscal injuries underwent traditional ultrasound, RTSCU, and MRI, which served as the gold standard, within a 14-day period.

Results of traditional ultrasound revealed sensitivity and specificity of 83% (95% CI, 0.70–0.97) and 88% (95% CI, 0.77–0.98), respectively. Sensitivity and specificity of compound ultrasound were slightly better, at 90% (95% CI, 0.79–1.00) and 90% (95% CI, 0.80–0.99), respectively. For regular ultrasound, the LR+ was 6.9 and the LR− was 0.19. For RTSCU, the LR+ was 9 and the LR− was 0.01. One flaw in this study was the difficulty in blinding the technicians due to the obvious difference in imaging modalities between the 2 ultrasound techniques.


Is a structured exercise program as effective as arthroscopic surgery for decreasing the pain of nontraumatic meniscal injuries?

Evidence-Based Answer

Yes. For patients who can tolerate the training protocol, a supervised exercise program is as effective as combined arthroscopic partial meniscectomy plus an exercise program in decreasing pain associated with nontraumatic meniscal injuries, when followed for up to 6 months. (SOR C, based on a single RCT using per-protocol analysis.)

A single RCT compared an 8-week supervised exercise program (E) with arthroscopic partial meniscectomy plus an 8-week supervised exercise program (AE) among 99 patients aged 45 to 64 with nontraumatic meniscal tears confirmed by MRI.\(^1\) Patients with trau-
matic meniscal injuries, other knee pathology (such as severe osteoarthritis), or contraindications to physical training were excluded. Nine patients did not complete the study and were excluded from analysis. Adequate power was achieved with 43 patients in the E group and 47 patients in the AE group. The exercise program included supervised and home exercises (shown in the TABLE), both performed twice a week. In the AE group, all meniscal tears were treated with partial meniscal resection.

Pain was assessed using a 10-point visual analog scale (VAS) and the 100-point pain subscale of the Knee Injury and Osteoarthritis Outcome Score (KOOS) at the start of the study, at 8 weeks, and at 6 months. At the start of the study, median VAS scores (10 being maximal pain) were not statistically different between the 2 groups (AE group 6 and E group 5 with movement; AE group 2 and E group 1 at rest). At 8 weeks, scores for both groups improved significantly and were equal—1 with movement and 0 at rest (P < .001 for both vs baseline scores). There was no further change in scores at 6 months.

Median KOOS pain scores (100 being pain free) at baseline were 56 in the AE group and 62 in the E group. At both 8 weeks and 6 months the AE group score was 89 and the E group score was 86. Between groups, scores were not significantly different at any assessments. Median scores within each group were statistically improved from baseline to 8 weeks and 6 months (P < .001).

The study did have some limitations. The narrow population studied limits the generalizability, the short-term follow-up does not exclude differences in long-term results, and the lack of comparison with placebo results in unconfirmed effectiveness of the treatments studied. In addition, per-protocol analysis was used rather than intention-to-treat.

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What is the most accurate way to screen for opiate addiction in patients on legitimate chronic opiate therapy?

Evidence-Based Answer
At present, not many screening tools are available with proven ability to help the clinician. The Screener and Opioid Assessment for Patients in Pain (SOAPP) can help identify patients on chronic narcotics who have aberrant drug-related behaviors (ADRBs), although the likelihood ratio for a positive test is small. (SOR B, based on validating cohort studies.) Further, the link between ADRBs and narcotic addiction is not robust. Pill counts and urine drug screening have not been convincingly shown to identify ADRBs. (SOR B, based on a systematic review of primarily lower quality studies.)

Opiate addiction has been defined as a primary, chronic, neurobiological disease characterized by impaired control over narcotic use, compulsive narcotic use, continued narcotic use despite harm, or craving. ADRBs are any behaviors that imply misuse of prescription medications, including forging or selling prescriptions, stealing medications, injecting oral medications, alcohol or drug abuse while taking medications, using nonmedical sources of medications, deteriorating patient function, noncompliance with regimen, losing medica-
What interventions improve outcomes for patients with isolated low levels of high-density lipoprotein (HDL)?

### Evidence-Based Answer

While an epidemiologic link between low HDL and cardiovascular risk exists, efforts to raise HDL have no significant effect on cardiovascular disease (CVD) or cardiovascular mortality after controlling for their simultaneous effect on lowering low-density lipoprotein (LDL). (SOR A, based on systematic review of RCTs.)

Epidemiological evidence and large cohort studies have demonstrated a strong relationship between low serum HDL levels and increased risk of CVD. This relationship was observed more than 30 years ago in the cohort of the Framingham Study. However, even the most robust association between low HDL levels and CVD risk does not establish proof that interventions solely to raise HDL levels will reduce the incidence of myocardial infarction (MI) and stroke.

A 2009 systematic review and meta-regression analysis of 108 trials (299,310 participants) reviewed studies that reported increased HDL and followed CVD clinical outcomes. The review included trials of multiple modalities for increasing HDL, including statins, fibrates, niacin, dietary change, and other agents.

After adjustment for changes in LDL produced by the same agents, analyses showed no association between treatment-induced change in HDL and CVD deaths, CVD events, and total death. The same data demonstrated that LDL lowering by 10 mg/dL reduced risk of CVD death and nonfatal MI by 4.9% (95% CI, 3.4–6.5; P<.001). These results therefore support decreasing LDL as the primary goal for lipid-modifying interventions.

These results confirm those of a 2007 systematic review of 31 randomized controlled trials that concluded “there is no definitive evidence proving that increasing HDL-C levels reduces the incidence of major cardiovascular events.”

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A Cochrane review identified 13 RCTs (n=34,410) assessing the effect of 5-ARIs versus placebo on prostate cancer period-prevalence. Overall, prostate cancer-prevalence from pooled data demonstrated a 26% relative risk reduction (RR=0.74; 95% CI, 0.55–1.00) and a 2.9% absolute reduction overall (6.3% vs 9.2%).

In subgroup analysis, men with baseline prostate-specific antigen (PSA) levels <4.0 ng/mL had a RR of 0.70 (95% CI, 0.64–0.77) and those with PSA levels >4 ng/mL had no risk reduction. The greatest risk reduction occurred in men with the lowest baseline PSA levels. One study, the Prostate Cancer Prevention Trial (PCPT), provided 88.2% of prostate cancer cases in this meta-analysis.

The PCPT, a randomized, placebo-controlled clinical trial, included 18,882 men who were >55 years, with PSA levels <3 ng/mL and normal digital rectal examinations. Patients were randomly assigned to receive either finasteride (5 mg daily) or placebo. At the end of this 7-year study, prostate cancer was detected in 18.4% of men in the finasteride group and 24.4% of men in the placebo group (ARR=6%; P<.001; NNT=17). There was a 25.5% increase in the prevalence of invasive tumors (Gleason score 8–10) in the finasteride group (6.4% vs 5.1%; P=.005; number needed to harm=77).

Experts have asserted that high-grade prostate cancer is selectively diagnosed more often in smaller prostates (a known effect of finasteride use), and that sampling bias alone could explain the excess of high-grade cancers among the finasteride-treated group.

In an international, double-blind, placebo-controlled RCT, 8,131 men were randomly assigned the 5-ARI dutasteride (0.5 mg/d) or placebo. The men had negative prostate biopsies 6 months prior to enrollment, were 50 to 75 years of age, and had a PSA of 2.5 to 10 ng/mL. Preliminary results for the 4-year study period were presented at the American Urologic Association Meeting in April 2009 and showed that dutasteride decreased the incidence of biopsy-detectable prostate cancer (20% for dutasteride vs 25% for placebo; ARR=5%, NNT=20; P<.0001).

Secondary endpoints showed no statistical difference in high-grade cancers with Gleason scores 7 to 10 (233/3,406 or 6.8% for placebo, vs 220/3,298 or 6.7% for dutasteride).

In 2003, a randomized, double-blind controlled trial compared 5- and 10-mg initiation protocols (TABLE). A total of 201 outpatients, with an age range of 18 to 98 years, who had confirmed deep venous thrombosis (DVT) or pulmonary embolism (PE) were randomly allocated to warfarin induction using either the 5- or 10-mg algorithm. Both groups were bridged with low-molecular-weight heparin until a therapeutic INR was achieved.
Patients in the 10-mg group achieved a therapeutic INR of 2 to 3 an average of 1.4 days earlier than patients in the 5-mg group (4.2 vs 5.6 days; \(P<.001\)). Eighty-three percent (95% CI, 74–89) in the 10-mg group were in the therapeutic range by day 5, compared with 46% (95% CI, 36–57) in the 5-mg group (\(P<.001\)). No difference was noted between groups in supratherapeutic INR results. In addition, over 3 months, no statistically significant difference was noted in recurrent thromboembolic events (2.9% in the 10-mg group and 0% in the 5-mg group; \(P=.09\)). The overall frequency of supratherapeutic INR readings (>3) was 14.5% in the 5-mg group and 3.7% in the 10-mg

A 2009 retrospective cohort study\(^1\) looked at the safety of the same 10-mg protocol in 414 outpatients followed for 90 days. Patients reached a therapeutic INR within 5 days 84% of the time. Recurrent thrombosis was diagnosed in 1.9% of patients. No thrombosis-related deaths occurred. Major bleeding occurred in 1% (4/414) of patients, all of which were gastrointestinal bleeds. Minor bleeding occurred in 0.7% (3/414) of patients. Only 22 patients (5.3%; 95% CI, 3.2–7.5) had an INR measurement >5 during the first 8 days of therapy.

A 2006 open-label randomized trial\(^3\) with 50 patients (both inpatient and outpatient) with DVT or PE compared the 5-mg with the 10-mg protocol. No significant difference was noted in achieving a therapeutic INR by day 5 in either the 5- or 10-mg dosing group (5 mg 13/25; 10 mg 14/25; \(P>.5\)). The overall frequency of supratherapeutic INR readings (>3) was 14.5% in the 5-mg group and 3.7% in the 10-mg

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**TABLE**

A 10-mg warfarin initiation protocol\(^1\)

<table>
<thead>
<tr>
<th>Warfarin Dose on Days 3, 4 (mg)</th>
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<th>Day 5 INR</th>
<th>Warfarin Dose on Days 5, 6, 7 (mg)</th>
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<td>&gt;4.0</td>
<td>0, 0, 2.5</td>
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</tbody>
</table>

All patients receive 10 mg on days 1 and 2.

INR=international normalized ratio.

group (P<.001). There were no episodes of major bleeding in the 5-mg group and 1 episode of major bleeding in the 10-mg group (P>.5).

A 2008 guideline from the American College of Chest Physicians published in Chest recommends either a 5- or 10-mg initiation dose on day 1 or 2 for most individuals, with subsequent dosing based on INR response (Grade 1B; strong recommendation with moderate quality of evidence). However, the guideline recommends a ≤5-mg initiation dose for special populations (patients who are >60 years, debilitated, or malnourished, or who have congestive heart failure, liver disease, or recent major surgery, or those taking medicines that increase sensitivity to warfarin) to minimize the risk of complications when initiating therapy (Grade 1C; strong recommendation with low quality of evidence).

What is the appropriate evaluation of a newborn with skin tags or pits near the ear?

**Evidence-Based Answer**

Infants with isolated preauricular skin tags and/or ear pits (PSEP) have a significantly higher prevalence of hearing impairment. (SOR A, based on multiple, consistent cohort studies.) Routine ultrasonography searching for occult renal disease is not indicated. (SOR A, based on consistent, prospective cohort studies.)

PSEP are relatively common, with a reported incidence ranging from 5 to 10 per 1,000 newborn infants. PSEP are considered of minor clinical importance, but can be seen with other craniofacial anomalies, genetic syndromes, sensorineural hearing impairment (HI), and urinary tract abnormalities.

Recent quality studies report a consistent association between PSEP and HI. The cohort of all infants (n=68,484) born in Israel from January 1997 through June 2004 were screened for HI. HI was found in 8 of 1,000 infants with PSEP compared with 1.5 of 1,000 infants without PSEP (OR 5; 95% CI, 2–12; P<.001). Most patients with HI were found to have skin tags (12 of 15) as opposed to ear pits (3 of 15). All infants except 1 (late-onset HI) were diagnosed by in-hospital hearing screening.

A separate study evaluated 4,507 consecutive infants, of which 26 (0.6% prevalence) were born with PSEP. This study documented conductive or sensorineural HI in 17% of newborn infants with isolated PSEP, and noted that the incidence of HI was 0.04% in all preschool children (P<.001). Conversely, recent quality studies fail to show a consistent association between PSEP and urinary tract anomalies. A prospective cohort study followed 108 infants born with isolated PSEP, 92 of whom were assessed for genitourinary abnormalities. The study group was compared with a control group (n=95) of consecutive infants without PSEP. The prevalence of renal abnormalities in the control group (3.1%) was not statistically significant from the study group (2.2%, P=1). This study concluded that renal ultrasound was not indicated in routine evaluation of infants with isolated PSEP.

Two additional prospective cohort studies found similar results. The first study evaluated 13,136 consecutive infants, 96 of whom had PSEP. Of those, 91

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**GLOSSARY**

<table>
<thead>
<tr>
<th>ARR</th>
<th>absolute risk reduction</th>
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<tbody>
<tr>
<td>CI</td>
<td>confidence interval</td>
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<tr>
<td>CT</td>
<td>computed tomography</td>
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<tr>
<td>LOE</td>
<td>level of evidence</td>
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<tr>
<td>MRI</td>
<td>magnetic resonance imaging</td>
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<tr>
<td>NNH</td>
<td>number needed to harm</td>
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<tr>
<td>NNT</td>
<td>number needed to treat</td>
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<tr>
<td>OR</td>
<td>odds ratio</td>
</tr>
<tr>
<td>RCT</td>
<td>randomized controlled trial</td>
</tr>
<tr>
<td>RR</td>
<td>relative risk</td>
</tr>
<tr>
<td>SOR</td>
<td>strength of recommendation</td>
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</tbody>
</table>

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We invite your questions and feedback. Email us at EBP@fpin.org.
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How accurate is ear thermometry for diagnosing fever in children?*

Evidence-Based Answer
On average, ear thermometers give about the same mean results as rectal thermometers. However, ear thermometer readings are not particularly sensitive for fever, limiting their acceptability in high-risk clinical situations. (SOR A, based on 2 systematic reviews.)

Many studies have compared different methods for thermometry, including core, axillary, oral, tympanic, or rectal techniques. Individual studies can be found to support any particular practice. However, 2 systematic reviews have been published that argue against the use of ear thermometry for detecting fevers.1,2

One meta-analysis included 31 studies with 4,441 children comparing rectal temperature using mercury, electronic, or indwelling probe thermometers with temperature measured by infrared thermometer at the ear.1 Overall, the pooled mean difference between rectal and ear temperatures was 0.29°C (95% CI, –0.74 to 1.32). However, because of the wide confidence interval, the authors concluded that ear temperature was not a good substitute for rectal temperature.

The other systematic review was conducted by the same authors and used data from 23 studies from the first meta-analysis; they determined the diagnostic accuracy of ear thermometers compared with the reference measure of rectal temperature.2 This analysis included 4,098 children and found that the pooled estimate of specificity for detecting a fever was 95.2% (95% CI, 93.5–96.9). However, the pooled estimate of sensitivity was only 63.7% (95% CI, 44.6–71.8). Based on these findings, the authors calculated that ear thermometry would miss one-third of children with a fever.

Another appraisal of available literature on tympanic membrane thermometry included studies on accuracy, factors affecting readings, and the preferences of children and parents.3 The author of this narrative review concluded tympanic thermometry provides the best means of measuring temperature in the acute healthcare setting.

In updating the previous HelpDesk Answer,4 there is no change to the original evidence-based recommendation. Ear thermometry is fast and easy, but its use should be limited to low-risk clinical situations.

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4. White D. How accurate is ear thermometry for diagnosing fever in children? Evidence-Based Practice. 2006; 9(9):5–6. [LOE 1a]

*This article is an update to: How accurate is ear thermometry for diagnosing fever in children? Evidence-Based Practice. 2006; 9(9):5–6.
Is membrane sweeping at term effective for decreasing postdates inductions?

Evidence-Based Answer
Sweeping of membranes at term results in fewer pregnancies continuing beyond 41 to 42 weeks of gestation, but is associated with minor vaginal bleeding, uterine irritability, and patient discomfort. (SOR A, based on a meta-analysis.) The technique appears to be just as effective in nulliparous and multiparous women. (SOR B, based on a single RCT.) There is a slight increase in the risk of premature rupture of membranes (PROM) in women dilated more than 1 cm. (SOR B, based on a single RCT.) In addition, membrane sweeping at the time of labor induction decreases both the need for oxytocin and induction-to-delivery time. (SOR B, based on a single RCT.)

Sweeping or stripping of the membranes is the manual separation of the chorioamniotic membranes from the lower uterine segment by a circular movement of the examiner’s finger.\(^1\) A recent Cochrane review of membrane sweeping and induction of labor analyzed 22 trials with 2,797 women.\(^2\) Of these, 20 trials compared membrane sweeping with usual care. Membrane sweeping at term was associated with a reduced proportion of pregnancies continuing beyond 41 weeks of gestation (RR 0.59; 95% CI, 0.46–0.74) or beyond 42 weeks (RR 0.28; 95% CI, 0.15–0.50). Although the studies used different gestational ages as induction targets, the authors calculated that about 8 women would need to undergo membrane sweeping at term to avoid 1 postdates pharmacological induction of labor.\(^2\)

In the Cochrane meta-analysis there was no evidence of increased risk of neonatal infection (RR 0.92; 95% CI, 0.30–2.82), maternal infection (RR 1.05; 95% CI, 0.68–1.65),\(^2\) or PROM (RR 1.14; 95% CI, 0.89–1.45). Membrane sweeping resulted in adverse events such as patient discomfort (RR 2.83; 95% CI, 2.03–3.96), minor vaginal bleeding (RR 1.75, 95% CI, 1.08–2.83), and uterine irritability (RR 3.20; 95% CI, 1.63–6.28).\(^2\)

In a Dutch multicenter RCT of 742 low-risk pregnancies in which postterm pregnancy was defined as ≥42 weeks’ gestation, membrane sweeping at 41 weeks was reported to be effective at reducing postterm pregnancy in both multiparous (RR 0.49; 95% CI, 0.34–0.73) and nulliparous women (RR 0.62; 95% CI, 0.48–0.81),\(^3\) with NNT=6 for both subgroups.

Another randomized trial of 300 term patients with uncomplicated pregnancies found no difference in overall risk of PROM between patients receiving membrane sweeping and those receiving usual care ($P=0.19$). But in subgroup analysis, if cervical dilation was greater than 1 cm at time of entry into study, there was a small but statistically significant increased risk of PROM in the membrane sweep intervention group compared with the control group (RR 1.10; 95% CI, 1.03–1.18).\(^4\)

Membrane sweeping also appears helpful at the time of induction. A recent RCT of 264 women at term reported that membrane sweeping at the start of labor induction increased the spontaneous vaginal delivery rate (69% vs 56%, $P=0.041$), with a NNT of 8 (95% CI, 4–78). Membrane sweeping also reduced the use of oxytocin (46% vs 59%, $P=0.037$), with a NNT of 8 (95% CI, 4–90) and shortened the induction-to-delivery time (14 vs 19 hours, $P=0.003$).\(^5\)

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“Evidence based medicine is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research.”

Is cognitive behavioral therapy an effective treatment for fibromyalgia?

Summary

The effect of cognitive behavioral therapy (CBT) is not particularly robust. As a single treatment for fibromyalgia, CBT is about as effective as an education program or exercise for improving syndrome-related variables such as adherence, coping, and improved physical functioning. CBT is also not effective in reducing pain levels. However, when CBT is used as a component of a multidisciplinary program, the combined therapy is particularly useful for patients experiencing fatigue. (SOR B, based on a review and randomized controlled trial [RCT].)

The evidence

Fibromyalgia syndrome is characterized by widespread pain and specific trigger points and is accompanied by sleep difficulties, stiffness, extreme fatigue, anxiety, and depression.1,2 A multidisciplinary approach is recommended in treating fibromyalgia syndrome, including medication and nonpharmacologic strategies, such as exercise and CBT.1,3

A review of nonpharmacologic treatments for fibromyalgia syndrome examined noncontrolled/quasi-controlled studies and 7 RCTs. The RCTs compared CBT with physical training, wait list, self-monitoring, education, CBT plus physical training, and standard medical care. Analysis of just the RCTs with 545 patients found that CBT was related to improvements in variables such as self-efficacy, adherence to exercise and relaxation, pain coping and control, pain behaviors, depression, and physical functioning. However, CBT did not improve participants’ level of pain in any of the studies.

Overall, CBT was more effective for improving syndrome-related symptoms and behaviors than control groups, but was not more effective when compared with an education program or with exercise. Multidisciplinary treatment that included CBT resulted in greater improvement in physical functioning, but not pain, versus standard medical care alone. The quality of the studies was variable; most did not describe the training and skill of the CBT providers, and the education program “control” groups often included group support.3

An RCT similarly found that CBT performed equally well as operant behavioral therapy (focusing on changing behavioral expressions of pain and positive reinforcement of pain-incompatible behaviors) when compared with a control group for improving functioning and pain reduction.2

A recent study not included in the review examined the effectiveness of adding CBT to multidisciplinary treatment (MT). Eighty-three female volunteers diagnosed with fibromyalgia syndrome according to American College of Rheumatology criteria were randomly assigned to either MT or MT with CBT groups. MT consisted of individual rheumatology visits and 14 1-hour groups led by rheumatologist, rehabilitation practitioner, and physiotherapist with education, physical exercise, and brief group discussion. The MT+CBT group received 15 group sessions led by a psychologist consisting of education, mind-body techniques to reduce distress, behavioral techniques to improve sleep, goal-setting and organization, coping skills strategies, improving life satisfaction, and social support. Thirty-one participants from the MT and 35 from the MT+CBT group completed the program and the posttreatment evaluations.3

All participants showed an improvement from baseline to posttreatment in scores on the Fibromyalgia Impact Questionnaire (FIQ), the Medical Outcomes Survey Short Form, and the Symptom Checklist 90, but the addition of CBT did not significantly increase the effect. In the subset of participants with fatigue, the MT+CBT group showed a significantly greater decline in mean FIQ scores, from 60.2 to 52.0 (out of a total possible score of 80), compared with the MT group’s change in scores from 58.5 to 57.2 (P=.021).1

The benefits of CBT in the treatment of fibromyalgia are mixed, but CBT does seem most promising as part of a multidisciplinary treatment plan.2

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REFERENCES

Do beta-blockers worsen respiratory status in patients with COPD?

Bottom line
No. There is no evidence that cardioselective beta-blockers worsen respiratory status in patients with chronic obstructive pulmonary disease (COPD). These medications should not be withheld when indicated for cardiovascular benefit. (SOR A, based on a meta-analysis.)

Evidence summary
In 2008, the Global Obstructive Lung Disease (GOLD) guidelines stated that beta-blockers commonly prescribed for heart disease are usually contraindicated in COPD. However, beta-blockers have an established mortality benefit in a variety of disease states that are commonly seen in conjunction with COPD.

A Cochrane meta-analysis was published in 2005 that combined 20 RCTs with a total of 278 patients to review the effects of cardioselective beta-blockers (atenolol, metoprolol, bisoprolol, practolol, celiprolol, and acebutolol) on pulmonary function in patients with COPD. The duration of studies ranged from a single dose to 12 weeks of therapy.

The long duration group (defined as 2 days to 12 weeks) had no significant change in FEV1 (weighted mean difference [WMD] 2.39%; 95% CI, −5.69 to 0.91), or respiratory symptoms (risk difference 0%; 95% CI, −0.05 to 0.05) compared with placebo. In 8 of the trials, the participants had documented comorbid cardiovascular conditions. In this subgroup of 141 patients, there was no significant effect on FEV1 for single doses (WMD −1.8%; 95% CI, −70.1 to 3.41) or longer duration therapy (WMD −4.2%; 95% CI, −9.32 to 0.92). The authors concluded that beta-blockers should not be withheld in patients with COPD.

Strengths of this review include homogeneity among the trials included, and use of 2 independent reviewers to extract data. The largest weaknesses of the study include the small sample size of most of the trials and that many of the studies were single-blinded rather than double-blinded. Additionally, much of the literature on this topic is old, having been published in the 1970s and 1980s.

These conclusions are similar to those of a more general meta-analysis from 2002 of blinded RCTs of beta-blocker use in patients with reactive airways disease. Twenty-nine trials met inclusion criteria, with 19 giving information on single beta-blocker dose studies and 10 providing data on continued treatment. One of the trials was specific to COPD and the remaining were specific to asthma or a combination of COPD and asthma.

Among all 29 trials, no significant difference was noted in pulmonary function between patients who received continued therapy with a cardioselective beta-blocker and patients who received placebo: for FEV1, the WMD was −0.42% (95% CI, −3.74 to 2.91); for symptoms the WMD was 0.01% (95% CI, −0.02 to 0.04), and for incidence of inhaler use the WMD was −0.11% (95% CI, −6.75 to 6.54). Importantly, cardioselective beta-blockers were actually associated with a significant increase in FEV1 compared with placebo after a beta-agonist such as albuterol was administered (WMD 8.74%; 95% CI, 1.96 to 15.52). The authors concluded that cardioselective beta-blockers should not be withheld in patients with reactive airways disease.

Strengths of this meta-analysis include all trials selected were randomized, controlled, and blinded; and, a diverse selection of beta-blockers were utilized. Weaknesses of the meta-analysis include the studies’ small sample sizes, short duration, and the inclusion of trials of both asthma and COPD.

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REFERENCES
BIG NEWS!

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For each question, please mark the single best answer by checking the appropriate box.

1. Which medication is not generally recommended as a first-line agent for controlling rate in a patient with atrial fibrillation with rapid ventricular rate?
   - a. Digoxin
   - b. Diltiazem
   - c. Verapamil
   - d. Metoprolol

2. Supervised exercise alone has been shown to be as effective as surgical treatment followed by supervised exercise for pain relief in which of the following conditions?
   - a. Medial traumatic tears
   - b. Degenerative tears with severe osteoarthritis
   - c. Degenerative tears without severe osteoarthritis
   - d. All of the above

3. Which medication may decrease the incidence of prostate cancer?
   - a. Sildenafil
   - b. Dutasteride
   - c. Saw palmetto
   - d. Doxazosin

4. Which statement is the most accurate regarding preauricular skin tags and/or pits (PSEP)?
   - a. Most PSEP are associated with major congenital malformations
   - b. Renal anomalies are common in infants with PSEP and require renal ultrasound prior to discharge from the nursery
   - c. Hearing impairment is increased in newborns with PSEP
   - d. Ear pits are much more worrisome than ear tags

5. In measuring body temperature:
   - a. All thermometers are equally sensitive for fevers
   - b. Ear thermometers are less sensitive in detecting fevers than rectal thermometers
   - c. Ear thermometers have a low specificity for detecting fevers
   - d. When comparing safety, cost, and patient acceptance, rectal thermometers are clearly preferred

6. A multigravida presents at 41 weeks’ gestation. She has heard that “membrane sweeping” will help her go into labor. You tell her that if you agree to her request, she can expect which of the following outcomes?
   - a. An increased risk of cesarean section
   - b. An increased risk of maternal infection
   - c. A reduced risk of induction with oxytocin
   - d. A reduced risk of vaginal bleeding

7. Which of the following techniques can be used alone to determine opioid addiction in patients taking chronic narcotics?
   - a. Screener and Opioid Assessment for Patients in Pain (SOAPP-1)
   - b. SOAPP-R
   - c. Serial urine drug screens
   - d. None of the above

8. When using a cardioselective beta-blocker in a patient with COPD, which of the following adverse outcomes will commonly occur?
   - a. Decrease in FEV1
   - b. Decreased response to beta-2 agonist
   - c. Increased use of rescue inhaler
   - d. None of the above
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