

# Towards evidence based emergency medicine: Best BETs from the Manchester Royal Infirmary

Edited by Kerstin Hogg

## BET 1: IS EXERCISE-RELATED TRANSIENT ABDOMINAL PAIN (STITCH) WHILE RUNNING PREVENTABLE?

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### ABSTRACT

A short cut review was carried out to establish whether drinking fluids was better than not drinking fluids at preventing exercise associated abdominal pain (stitch) in runners. 112 papers were found using the reported searches, of which 2 presented the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results and study weaknesses of these best papers are tabulated. It is concluded that drinking fluids before running is associated with stitch.

### THREE-PART QUESTION

In (runners) does (not drinking fluids) prevent (exercise-related transient abdominal pain or stitch) compared to (drinking fluids)?

### CLINICAL SCENARIO

A 23-year-old woman started a graduated training programme for 10 weeks since she set her goal to run 5 km non-stop. While running, she has stabbing pain under the lower edge of the ribcage, which causes her to stop. She asks you if exercise-related transient abdominal pain (or stitch) is preventable, for example, by not drinking fluids before and during the run.

### SEARCH STRATEGY

We searched the following databases from date of inception to 15 June 2012:

1. The Cochrane Library using the Wiley interface: (MeSH descriptor Sports explode all trees OR MeSH descriptor Exercise explode all trees) AND (MeSH descriptor Abdomen, Acute explode all trees OR 'stitch' OR 'side ache' OR 'side

Best Evidence Topic reports (BETs) summarise the evidence pertaining to particular clinical questions. They are not systematic reviews, but rather contain the best (highest level) evidence that can be practically obtained by busy practising clinicians. The search strategies used to find the best evidence are reported in detail in order to allow clinicians to update searches whenever necessary. Each BET is based on a clinical scenario and ends with a clinical bottom line, which indicates, in the light of the evidence found, what the reporting clinician would do if faced with the same scenario again.

The BETs published below were first reported at the Critical Appraisal Journal Club at the Manchester Royal Infirmary<sup>1</sup> or placed on the BestBETs website. Each BET has been constructed in the four stages that have been described elsewhere.<sup>2</sup> The BETs shown here together with those published previously and those currently under construction can be seen at <http://www.bestbets.org>.<sup>3</sup> Three BETs are included in this issue of the journal.

1. **Carley SD, Mackway-Jones K, Jones A, et al.** Moving towards evidence based emergency medicine: use of a structured critical appraisal journal club. *J Accid Emerg Med* 1998;**15**:220–2.
2. **Mackway-Jones K, Carley SD, Morton RJ, et al.** The best evidence topic report: a modified CAT for summarising the available evidence in emergency medicine. *J Accid Emerg Med* 1998;**15**:222–6.
3. **Mackway-Jones K, Carley SD.** bestbets.org: odds on favourite for evidence in emergency medicine reaches the worldwide web. *J Accid Emerg Med* 2000;**17**:235–6.

cramp' OR 'side pain' OR 'exercise-related transient abdominal pain')

2. MEDLINE via PubMed interface: ('sports'[MeSH] OR 'exercise'[MeSH]) AND ('abdomen, acute'[MeSH] OR 'stitch'[TW] OR 'side ache'[TW] OR 'side cramp'[TW] OR 'side pain'[TW] OR 'exercise-related transient abdominal pain'[TW] OR 'ETAP'[TW])
3. Embase via Embase.com interface: ('sport/exp OR 'exercise/exp) AND ('acute abdomen/exp OR 'stitch' OR 'side ache' OR 'side cramp' OR 'side pain' OR 'exercise-related transient abdominal pain' OR 'ETAP')

### SEARCH OUTCOME

1. The Cochrane library: no Cochrane reviews and two clinical trials were found, both relevant to the clinical question.
  2. MEDLINE: 41 studies were found, no additional study was selected.
  3. Embase: 69 studies were found, no additional study was selected.
- No further papers were found by scanning the references of relevant papers. All relevant papers are summarised in table 1.

### COMMENT

As all subjects in both studies consumed water before the testing exercise, stitch as a

consequence of dehydration seems unlikely. All subjects were asked to fast for at least 5 h (Morton *et al*) or to abstain from eating in the morning (Plunkett and Hopkins) before the trial, but not all test persons followed the 'eating protocol' (ie, 40% of the subjects of the trial of Plunkett and Hopkins preferred to consume their normal breakfasts). Only statistical tests (ie, p values) and conclusions about the comparison of fluid versus no fluid intake were described in the evidence table above and the clinical bottom line below, because the three part question deals with this comparison.

### Clinical bottom line

In conclusion, drinking large quantities immediately before exercise is associated with exercise-related stitch.

- ▶ **Plunkett BT, Hopkins WG.** Investigation of the side pain induced by running after fluid ingestion *Med Sci Sports Exerc* 1999;**31**:1169–75.
- ▶ **Morton DP, Aragón-Vargas LF, Callister R.** Effect of ingested fluid composition on exercise-related transient abdominal pain. *Int J Sport Nutr Exerc Metab* 2004;**14**:197–208.

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doi:10.1136/emered-2012-201952.1

**Table 1** Relevant papers

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Plunkett and Hopkins, 1999, New Zealand	10 Healthy men (age $21 \pm 2$ years, height $180 \pm 5$ cm and weight $81 \pm 8$ kg; mean $\pm$ SD). All subjects consumed 200–300 ml of water at 1.5–2 h before the testing exercise. Shortly before exercise, subjects were subjected to a body-mass-adjusted volume (14 ml/kg) of each of four fluids: water, commercially available energy drink Exceed (main energy constituent is glucose polymers), decarbonated Coca Cola (main energy constituent is sucrose) and a hypertonic solution of the sugar lactulose or no fluid. Each exercise session consisted of 5-min bouts of hard running on a treadmill, with 10 min rest between each bout. There were several days between each testing exercise.	Crossover trial (randomised according to Latin square design) (level of evidence 2b)	Mean intensity of stitch during first bout Mean intensity of stitch by the fourth and fifth bout	Significantly more with each type of fluid compared to no fluid ( $p < 0.0001$ ) Significantly more with each type of fluid (except for Exceed) compared to no fluid ( $p = 0.003–0.02$ )	Small study population; lack of objective method of verifying the intensity of stitch; no statistical analysis was performed to compare no fluid versus fluid consumption in second and third bout; allocation concealment is not described
Morton <i>et al</i> , 2004, Australia	40 Subjects (30 men and 10 women; age $21.0 \pm 0.5$ years, height $177.1 \pm 1.4$ cm and weight $71.9 \pm 1.9$ kg; mean $\pm$ SEM); susceptible to ETAP). All subjects consumed 500 ml of water at 2 h before testing exercise. Shortly before and during exercise, subjects were subjected to a body-mass-adjusted volume (2 ml/kg at start and during exercise) of each of three fluids: flavoured water, sports drink and reconstituted fruit juice or no fluid. Each exercise session consisted of one trial of 23 min running on a treadmill. There was approximately 1 week between each testing exercise.	Crossover trial (randomised according to Latin square design) (level of evidence 2b)	Incidence of ETAP (percentage of subjects) Severity of ETAP (mean $\pm$ SEM) Duration of ETAP (min $\pm$ SEM)	No fluid: 40%; flavoured water: 70% ( $p < 0.05$ compared to no fluid); sports drink: 70% ( $p < 0.05$ compared to no fluid); fruit juice: 83% ( $p < 0.05$ compared to no fluid) Mean severity: no fluid: $0.4 \pm 0.1$ ; flavoured water: $0.6 \pm 0.1$ ( $p > 0.05$ compared to no fluid); sports drink: $0.8 \pm 0.2$ ( $p > 0.05$ compared to no fluid); fruit juice: $1.3 \pm 0.2$ ( $p < 0.05$ compared to no fluid) No fluid: $6.8 \pm 0.7$ min; flavoured water: $9.8 \pm 1.2$ min ( $p > 0.05$ compared to no fluid); sports drink: $13.2 \pm 1.4$ min ( $p < 0.05$ compared to no fluid); fruit juice: $14.4 \pm 1.0$ min ( $p < 0.05$ compared to no fluid)	Rate of fluid ingestion was high beyond that which occurs in a typical exercise situation and which is recommended by the American College of Sports Medicine (600–1000 ml/h); lack of objective method of verifying the intensity of stitch; allocation concealment is not described

ETAP, exercise-related transient abdominal pain.



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