Do triage systems in healthcare improve patient flow? A systematic review of the literature
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CRD summary
The authors concluded that triage systems can improve patient flow across diverse healthcare settings. Potential biases in the review process and reliance on poorer quality studies make the reliability of the conclusion unclear.

Authors' objectives
To examine whether triage systems affected patient flow in healthcare services.

Searching
MEDLINE, CINAHL, EMBASE, PsycINFO and AMED were searched from the earliest available date until August 2009. Search terms were reported. Only peer-review publications in English were included. Conference proceedings and unpublished dissertations were excluded. Reference lists from included studies and review articles were searched for additional studies. Citation tracking through Web of Knowledge was conducted on the included papers.

Study selection
Studies that evaluated triage systems in healthcare settings where patients were ranked in order of priority or sorted into the most appropriate service were included. Studies had to report at least one outcome measure related to patient flow (such as waiting time, length of stay and length of waiting list). No study design restrictions were applied as long as comparative data were available (such as pre- and post-intervention data or a comparison group). Interventions such as screening and fast tracking, and systems designed for very specific health conditions or procedures (such as organ transplants) were excluded.

Most included studies were observational designs. Some studies were conducted in UK. The most frequent setting for studies was acute hospital emergency departments; others were child and adolescent mental health, sexual health, dental health and obstetrics services. The most commonly reported outcome measures were waiting time from presentation, referral to initial assessment and length of stay in the service.

Study selection was conducted by two researchers independently. Disagreements were resolved by consensus.

Assessment of study quality
The authors used the PEDro scale of randomisation, allocation concealment, baseline differences, blinding, drop-out, intention-to-treat and other criteria to assess quality and assign scores from 1 to 10. Higher numbers indicated better quality; scores lower than 3 were considered poor quality.

Quality assessment was conducted by two researchers independently.

Data extraction
Data were extracted on various measures, which included direction of effect and time spent in the service. Where data permitted, effect sizes (standardised mean differences) were calculated. Any standard deviations that were not reported were estimated using standard formulas.

The authors did not state how many reviewers extracted data.

Methods of synthesis
Data were tabulated and analysed using descriptive synthesis. Studies were grouped according to interventions and comparisons. Where available, effect sizes were displayed in forest plots without calculating a pooled estimate.

Results of the review
Twenty-five studies were included in the review. Sample sizes ranged from 50 to 6,790 and included data from more than 35,000 patients. Only one study was an individually randomised controlled trial; two studies randomly allocated shifts to intervention or control. Patients were blinded to the intervention in all except one of the studies. The included
studies scored an average of 3.6 (standard deviation 1.5) and ranged from 1 to 7 on the PEDro scale. Half of the included studies were considered poor quality.

**Basic triage versus informal or no triage:** Seven studies were included and found conflicting results on patient flow. Four were conducted in emergency departments, one in a delivery and labour unit, one in a dental service and one in a community mental health service.

**Comparison of basic triage systems:** Four studies were included and all found significant reductions in waiting time and/or length of stay. Three studies adapted triage criteria for specific patient groups (chest pain, paediatric and mental health). The other study examined the impact of prioritising treatable cases in a child and adolescent mental health service.

**Triage with management options versus prioritisation only:** Eight studies were included and found significant reductions in waiting time and/or length of stay. Three studies adapted triage criteria for specific patient groups (chest pain, paediatric and mental health). The other study examined the impact of prioritising treatable cases in a child and adolescent mental health service.

Three studies evaluated use of a multidisciplinary triage clinic. All three found that more than 20% of patients were discharged at triage, reductions in waiting times or reduced number of patients on the waiting list. Two further studies in sexual health clinics also found evidence of improvements in patient flow.

**Authors' conclusions**
The authors concluded that triage systems can improve patient flow across diverse healthcare settings. There was conflicting evidence concerning the benefits of basic triage systems and moderate evidence that managing less resource intensive cases or redirecting inappropriate referrals at point of triage could improve patient flow.

**CRD commentary**
The objectives and inclusion criteria of the systematic review were clear. The electronic search provided good coverage of databases. Limiting the review to published peer-reviewed studies in English risked publication and language biases. Efforts were made to minimise bias in study selection and quality assessment; it was not clear that similar efforts were made during data extraction. The tool used for quality assessment appeared appropriate. Most studies used a pre- and post-intervention observational study design (highly susceptible to bias). Study details were presented clearly. The diversity of study characteristics meant that a narrative synthesis was appropriate.

Potential biases in the review process and reliance on poorer quality studies make the reliability of the conclusion unclear.

**Implications of the review for practice and research**
**Practice:** The authors stated that triage systems in a diverse range of healthcare settings may improve quality of patient care through reduced waiting time, shorter waiting lists and reduced length of stay. Triage providers should collect an appropriate level of detail on patient needs to enable decisions on prioritising care. For example, where patients required a simple intervention that could be conducted by the triage provider this should be done immediately and patients who did not meet triage criteria should be redirected to other services.

**Research:** The authors did not state any implications for further research.

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.