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| Question |
| **Should cling film vs. milk be used for avulsed human teeth?** |
| **Population:** | Avulsed permanent human teeth |
| **Intervention:** | Storage using Cling film |
| **Comparison:** | Storage in cow’s milk |
| **Main outcomes:** | Viability as estimated by rate of cell growth (2 days) after 120 min immersion; rate of cell growth (7 days) after 120 min immersion; rate of cell growth (14 days) after 120 min immersion. |
| **Setting:** | Clinical and laboratory in relation to prehospital management |
| **Perspective:** | First aid provider |
| **Background:** | While it is recognized that immediate replantation of an avulsed permanent tooth provides the best opportunity for tooth survival, this may not be possible in the first aid setting. This review evaluates means of temporarily storing an avulsed tooth until the tooth can be replanted. |
| **Conflict of interests:** | None declared |

# Assessment

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| ProblemIs the problem a priority? |
| Judgement | Research evidence | Additional considerations |
| ○ No○ Probably no● Probably yes○ Yes○ Varies○ Don't know | The oral region comprises 1% of the total body area, yet it accounts for 5% of all bodily injuries. In preschool children, oral injuries estimated at 17% of all bodily injuries. The incidence of traumatic dental injuries is estimated at 1%-3%. Prevalence is steady at 20%-30% (Anderson 2013 S2). Several groups investigating injury rates across non–mouthguard mandated sports (e.g., baseball, basketball, soccer) estimated that orofacial injuryrates ranged from 3%-38% of all sport-specific injuries (Kvittem 1998 288; Kumamoto 2004 270).During the last decade traumatic dental injuries were recognized as a public dental health problem worldwide (Zaleckiene 2014 7). |  |
| Desirable EffectsHow substantial are the desirable anticipated effects? |
| Judgement | Research evidence | Additional considerations |
| ○ Trivial● Small○ Moderate○ Large○ Varies○ Don't know | For the critical outcome of viability (as measured by the probability and rate of PDL cell growth), we have identified very-low-certainty evidence (downgraded for risk of bias, indirectness and imprecision) from 1 randomized study (Zeissler-Lajtman 2017 954) including 14 extracted teeth, showing benefit in rate of cell growth after 7 and 14 days following 120 min storage in cling film when compared with immersion in milk (unspecified) (MD, 0.45; 95% CI could not be calculated and MD, 0.41; 95% CI could not be calculated; P=0.033; respectively).

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| ***Certainty assessment*** | ***№ of patients*** | ***Effect*** | ***Certainty*** | ***Importance*** |
| ***№ of studies*** | ***Study design*** | ***Risk of bias*** | ***Inconsistency*** | ***Indirectness*** | ***Imprecision*** | ***Other considerations*** | ***cling film*** | ***milk*** | ***Relative(95% CI)*** | ***Absolute(95% CI)*** |
| ***Rate of cell growth (2 days) after 120 min immersion (Zeissler-Lajtman 2017)*** |
| *1*  | *randomised trials*  | *serious a,b,c,d* | *not serious*  | *serious e,f* | *serious g,h* | *none*  | *7*  | *7*  | *-*  | *MD* ***0.14 lower*** *i,j* | *⨁◯◯◯VERY LOW*  | *CRITICAL*  |
| ***Rate of cell growth (7 days) after 120 min immersion (Zeissler-Lajtman 2017)*** |
| *1*  | *randomised trials*  | *serious a,b,c,d* | *not serious*  | *serious e,f* | *serious g,h* | *none*  | *7*  | *7*  | *-*  | *MD* ***0.45 higher*** *i,j,k* | *⨁◯◯◯VERY LOW*  | *CRITICAL*  |
| ***Rate of cell growth (14 days) after 120 min immersion (Zeissler-Lajtman 2017)*** |
| *1*  | *randomised trials*  | *serious a,b,c,d* | *not serious*  | *serious e,f* | *serious g,h* | *none*  | *7*  | *7*  | *-*  | *MD* ***0.41 higher****i,j,k* | *⨁◯◯◯VERY LOW*  | *CRITICAL*  |

 | Treatment of dental and oral injuries can cost upwards of 15,000$ over an individual’s lifetime.Important public health implications such as how to best organize emergency dental care and how to prevent dental injuries, decrease cost, and increase lay knowledge are important factors needed to change epidemiologic data toward more favorable figures in the future (Gould 2016 821). |
| Undesirable EffectsHow substantial are the undesirable anticipated effects? |
| Judgement | Research evidence | Additional considerations |
| ○ Large○ Moderate○ Small○ Trivial○ Varies● Don't know | The included study did not report any undesirable effects. |  |
| Certainty of evidenceWhat is the overall certainty of the evidence of effects? |
| Judgement | Research evidence | Additional considerations |
| ● Very low○ Low○ Moderate○ High○ No included studies | There are limitations in study design, indirectness and imprecision. |  |
| ValuesIs there important uncertainty about or variability in how much people value the main outcomes? |
| Judgement | Research evidence | Additional considerations |
| ○ Important uncertainty or variability○ Possibly important uncertainty or variability● Probably no important uncertainty or variability○ No important uncertainty or variability | There is no research evidence on how much people value the main outcomes. | Developed countries may place more value on personal hygiene and personal appearance, thus, the ability to save a tooth in developed countries is likely more desirable. |
| Balance of effectsDoes the balance between desirable and undesirable effects favor the intervention or the comparison? |
| Judgement | Research evidence | Additional considerations |
| ○ Favors the comparison○ Probably favors the comparison○ Does not favor either the intervention or the comparison● Probably favors the intervention○ Favors the intervention○ Varies○ Don't know | There is benefit for rate of cell growth after 7 and 14 days. No undesirable effects were reported.  |  |
| Resources requiredHow large are the resource requirements (costs)? |
| Judgement | Research evidence | Additional considerations |
| ○ Large costs○ Moderate costs● Negligible costs and savings○ Moderate savings○ Large savings○ Varies○ Don't know | Cling film is available in every grocery store for a very small cost.  | In developed countries, much of the cost of saving a tooth can be outweighed by the overall cost needed to replace a tooth. However, the cost of commercial materials could be a challenge for many developing countries. |
| Certainty of evidence of required resourcesWhat is the certainty of the evidence of resource requirements (costs)? |
| Judgement | Research evidence | Additional considerations |
| ○ Very low○ Low○ Moderate○ High● No included studies | No studies were identified on resource requirements. |  |
| Cost effectivenessDoes the cost-effectiveness of the intervention favor the intervention or the comparison? |
| Judgement | Research evidence | Additional considerations |
| ○ Favors the comparison○ Probably favors the comparison○ Does not favor either the intervention or the comparison● Probably favors the intervention○ Favors the intervention○ Varies○ No included studies | Cling film is readily available worldwide. | A 200-foot-long roll of typical supermarket plastic cling wrap costs about US$5.00 a box or as little as 2GBP for 40 m. |
| EquityWhat would be the impact on health equity? |
| Judgement | Research evidence | Additional considerations |
| ○ Reduced○ Probably reduced● Probably no impact○ Probably increased○ Increased○ Varies○ Don't know | No research evidence was identified on health equity. |  |
| AcceptabilityIs the intervention acceptable to key stakeholders? |
| Judgement | Research evidence | Additional considerations |
| ○ No○ Probably no● Probably yes○ Yes○ Varies○ Don't know | No research evidence was identified. | Cling film is available in almost all households and easy to store a tooth in. No additional containers are needed, just wrap the tooth in the cling film. |
| FeasibilityIs the intervention feasible to implement? |
| Judgement | Research evidence | Additional considerations |
| ○ No○ Probably no● Probably yes○ Yes○ Varies○ Don't know | No research evidence identified. | Cling wrap, although it sounds easy to use, from a practical point of view may be difficult to stock in a first aid kit as commonly packaged Most cling wrap comes in 30cm long (1 foot) rolls. One could cut smaller squares of cling wrap to put in a first aid kit, but it may be difficult to store properly. Use of cling wrap may be more practical in the home environment or school setting rather than as an item to be stored in a first aid kit.  |

# References

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# Summary of judgements

|  | **Judgement** |
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| **Problem** | No | Probably no | **Probably yes** | Yes |  | Varies | Don't know |
| **Desirable Effects** | Trivial | **Small** | Moderate | Large |  | Varies | Don't know |
| **Undesirable Effects** | Large | Moderate | Small | Trivial |  | Varies | **Don't know** |
| **Certainty of evidence** | **Very low** | Low | Moderate | High |  |  | No included studies |
| **Values** | Important uncertainty or variability | Possibly important uncertainty or variability | **Probably no important uncertainty or variability** | No important uncertainty or variability |  |  |  |
| **Balance of effects** | Favors the comparison | Probably favors the comparison | Does not favor either the intervention or the comparison | **Probably favors the intervention** | Favors the intervention | Varies | Don't know |
| **Resources required** | Large costs | Moderate costs | **Negligible costs and savings** | Moderate savings | Large savings | Varies | Don't know |
| **Certainty of evidence of required resources** | Very low | Low | Moderate | High |  |  | **No included studies** |
| **Cost effectiveness** | Favors the comparison | Probably favors the comparison | Does not favor either the intervention or the comparison | **Probably favors the intervention** | Favors the intervention | Varies | No included studies |
| **Equity** | Reduced | Probably reduced | **Probably no impact** | Probably increased | Increased | Varies | Don't know |
| **Acceptability** | No | Probably no | **Probably yes** | Yes |  | Varies | Don't know |
| **Feasibility** | No | Probably no | **Probably yes** | Yes |  | Varies | Don't know |

# Type of recommendation

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| Strong recommendation against the intervention | Conditional recommendation against the intervention | Conditional recommendation for either the intervention or the comparison | **Conditional recommendation for the intervention** | Strong recommendation for the intervention |
| ○  | ○  | ○  | **●**  | ○  |

# Conclusions

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| Recommendation |
| We suggest the use of cling film, compared with cow’s milk, as a storage technique for an avulsed permanent tooth that cannot be immediately replanted. |
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| Justification |
| Although only a single study was identified evaluating the use of cling wrap to store an avulsed tooth, the results are promising, and this intervention offers a simple, safe and low cost means of temporarily storing an avulsed permanent tooth before replantation can be performed. |

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| Subgroup considerations |
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| Implementation considerations |
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| Monitoring and evaluation |
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| Research priorities |
| Additional studies are needed evaluating outcomes of tooth survival following avulsion with storage in cling wrap from clinical settings to confirm the findings of the included study. |