

COURSE OF TREATMENT DEFINITION (see *Section 4.2.2*)

A course of treatment as defined Standard General Dental Services Contract (2013) states:

- (a) “subject to paragraph (c), an examination of a patient, an assessment of his oral health, and the planning of any treatment to be provided to that patient as a result of that examination and assessment,
- (b) the provision of any planned treatment (including any treatment planned at a time other than the time of the initial examination) to that patient, and
- (c) but where the course of treatment is an interim care course of treatment provided under a Capitation and Quality Scheme 2 Agreement in the context of regulation 13A of the NHS Charges Regulations, it does not include the treatment mentioned in paragraph (a).

provided by, except where expressly provided otherwise, one or more providers of primary dental services, but it does not include the provision of any *orthodontic services* or *dental public health services*.”[1]

So if a child has a number of visits for one treatment, e.g. 3 fillings for dental decay were identified at an initial examination but were provided at subsequent visit(s), additional UDAs were not provided for the additional visits. Thus, the reimbursement mechanism for England and Wales provides a potential incentive for under treatment.

Initially, we assumed, based on clinical advice and current regulations that a new course of treatment would be defined as:

- a) Any visit after 90 days^a (supported by the Dental Assurance Framework)[2]

While this assumption would be sensible when treating adults for the management of children the following issues were considered for the economic analysis;

- a) Children could come back for a completely new course of treatment (potentially due to a newly apparent problem), or
- b) The same treatment/pain that would be classified as one course of treatment but the practice may have “closed” their course of treatment even if it was not complete as they were not back within a specific timeframe or for other reasons and start their treatment as a new course of treatment.

As a result, this led to the following assumptions for defining a course of treatment:

- a) All visits after 60 days^b were defined as a new course of treatment. This is supported by the guidance in the Dental Contract Management Handbook [3] where practices are discouraged from making potentially inappropriate new Band 1/2/3 claims within 2 months of a previous claim.
- b) Visits between 1 and 28 days were still be regarded as 1 course of treatment regardless of pain, treatment etc. as we could assume it is was related to the original problem. The 28 Day Re-attendance Review strongly discouraged new Band 1/2/3 claims within 28 days.[4]
- c) Visits between 29 days and 60 days would be a new course of treatment if the child had an emergency visit.
- d) Visits between 29 days and 60 days were a new course of treatment if the child had experienced pain and had operative treatment. This is based upon the assumption that most of these cases were probably not delivering care within an open treatment plan, despite the research paperwork completed by the dentist.

^a 30 days = 1 month

^b 30 days = 1 month

Assumption (d) at present leads to a slight overestimate of UDAs, but removing this assumption would lead to an underestimate. The assumptions were explored in sensitivity analyses to see what affect, if any, they had on overall results. Figure A is an illustrative presentation of the course of treatment pathway.

References

1. Standard General Dental Services Contract. 2013, Department of Health: <https://www.gov.uk/government/publications/standard-general-dental-services-contract-and-personal-dental-services-agreement>.
2. NHS England. Dental Assurance Framework. Policy & Corporate Procedures. 2014: <https://www.england.nhs.uk/wp-content/uploads/2014/05/dental-assurance-frmwrk-may.pdf>.
3. Department of Health. Dental Contract Management Handbook. 2010: https://www.pcc-cic.org.uk/sites/default/files/articles/attachments/dental_handbook_2010_version_1_0_1.pdf.
4. NHS Business Service Authority. Dental Activity Reviews. 28 Day Re-attendance. 2016: <http://www.nhsbsa.nhs.uk/DentalServices/5143.aspx>.

DEFINING A FILLING (see *Section 4.2.2*)

We had information on the restoration material used but could not determine whether this was done as part of a filling or a sealant (e.g. glass ionomer). We had established that different resources were needed for fillings hence we need to distinguish between the two. The following conservative assumptions were applied to create a dummy variable to indicate whether or not a tooth had been filled.

A filling had been provided if:

- the number of surfaces used > 1 & filling material was used
- complete caries removal was undertaken & filling material was used
- partial caries removal was undertaken & filling material was used
- local anaesthetic was attempted & filling material was used
- if sealant was not provided & filling material was used

While these assumptions were applicable clinically they were insufficient to account for all of the operative treatments recorded as part of FiCTION. As a result we adopted additional assumptions to distinguish between fillings and sealants.

A filling had not been provided if:

- if sealant was indicated on the CRF (note: this assumption over-rides previous assumptions)
- if a crown (conventional/halls) was provided

For those cases that could not be defined with the rules above (<20%) we adopted the following assumptions

- A filling had been undertaken if sealant over restoration was indicated on the CRF
- A filling had not been undertaken if the tooth was extracted
- A filling had not been undertaken if a lesion was opened
- A filling had not been undertaken if all operative treatment information was missing
- A filling had not been undertaken if pulpotomy was undertaken
- A filling had been undertaken if caries removal (partial/complete) was undertaken, local anaesthetic was attempted and the number of surfaces > 1 even if there no information on restoration material – assumed they would dress the tooth with glass ionomer in these instances
- A filling had been undertaken if caries removal (partial/complete) was undertaken and local anaesthetic was attempted but number of surfaces and information on restoration material was missing (n=2) – again we assumed they would dress the tooth with glass ionomer
- A filling was not undertaken if no caries removal was undertaken and no local anaesthetic was attempted

Finally, there were some outliers that still couldn't be defined with the above rules (<1%) that required additional assumptions the data to distinguish between fillings and sealants:

- A filling was not undertaken if no local anaesthetic was attempted
- A filling was no undertaken if there was not caries removal attempted and no filling material was indicated

MICRO-COSTING UNIT COSTS

RESOURCES USED AT EVERY VISIT			
Consumables	Cost/item	Source	Date
Disposable gloves	£0.13	https://www.dentalsky.com/medibase-blue-nitrile-powder-freeglovesx100-m-medibase.html	26/04/2017
Disposable mask	£0.08	https://www.dentalsky.com/medibase-masks-earloop-blue-50-medibase.html	26/04/2017
Disposable bibs	£0.11	https://www.dentalsky.com/medibase-disposable-bibs-light-blue-500-medibase.html	26/04/2017
Tissues	£0.01	https://www.dentalsky.com/p-facial-tissues-20x10-cm-72x100-sheets-perfection-plus.html	26/04/2017
Disposable cup	£0.01	https://www.dentalsky.com/medibase-plastic-cups-light-blue-3000-medibase.html	26/04/2017
Mouthwash Tablet	£0.01	https://www.dentalsky.com/pegasus-mouthwash-tablets-green-1000-pegasus.html	26/04/2017
3 in 1 tip	£0.21	https://www.dentalsky.com/sanitip-pack-of-200-std-76mm-no-sanishield-dentsply.html	26/04/2017
Sheath	£0.06	https://www.dentalsky.com/pegasus-surgi-safe-tubing-sleeve-small-pegasus.html	26/04/2017
PREVENTATIVE CARE			
Consumables	Cost/item	Source	Date
Disclosing tablets	£0.09	https://www.dentalsky.com/plaqsearch-tablets-20-tepe.html	26/04/2017
Dental floss	£0.02	https://www.dentalsky.com/oral-b-essential-floss-50m.html	26/04/2017
Dental wand	£0.04	https://www.dentalsky.com/wisdom-clean-between-flossers-p-shape-mint-30.html	26/04/2017
Page with instructions	£0.54	http://www.ncl.ac.uk/library/services/print-bind-copy/print-services/printing/#5	05/05/2017
LOCAL ANAESTHESIC			
Consumables	Cost/item	Source	Date
Topical anaesthetic gel (e.g Xylonor)	£0.05	https://www.dentalsky.com/xylonorgel-15g-paste-septodont.html	26/04/2017
Disposable Cartridge	£0.48	https://www.medicinescomplete.com/mc/bnf/current/DMD21313511000001103.htm?q=Lignospan%20Special%202%25%20injection%202.2ml%20cartridges%20%28Kent%20Pharmaceuticals%20Ltd%29&t=search&ss=text&tot=1&p=1#DMD21313511000001103	26/04/2017
Cotton wool roll	£0.01	https://www.dentalsky.com/medibase-cotton-rolls-no2-300g-medibase.html	26/04/2017
Needle	£0.08	https://www.dentalsky.com/pegasus-hdent-needles-27g-long-100-pegasus.html	26/04/2017
FLUORIDE VARNISH			
Consumables	Cost/item	Source	Date
Micro-brush	£0.06	https://www.dentalsky.com/medibase-applicator-brushes-regular-blue-100-medibase.html	26/04/2017
Varnish	£0.17	https://www.dentalsky.com/duraphat-varnish-colgate.html	26/04/2017
Dappen's dish	£0.03	https://www.dentalsky.com/disposable-dappen-dishes.html	26/04/2017

FISSURE SEALANTS			
Consumables	Cost/item	Source	Date
Etch	£0.30	https://www.dentalsky.com/clinixgel-etch-12g-syringe-tips-20-clinix.html	26/04/2017
Aspirator tips	£0.02	https://www.dentalsky.com/orsing-aspirator-tips-white-135cm-100-jh-orsing-ab.html	26/04/2017
Dry tips	£0.43	https://www.dentalsky.com/dry-tips-child-50-molnlycke.html	26/04/2017
Resin	£1.91	https://www.dentalsky.com/clinpro-sealant-sealant-bottle-6ml-3m-espe.html	26/04/2017
Glass ionomer cement capsule	£4.08	https://www.dentalsky.com/ketac-cem-maxicap-50-capsules-3m-espe.html	26/04/2017
Glass ionomer cement powder sachet	£0.17	https://www.dentalsky.com/carboxylate-cement-powder-90g-heraeus-kulzer.html	26/04/2017
Disposable paper mixing pad	£0.02	https://www.dentalsky.com/medibase-mixing-pads-7x8cm-3x100-sheets-medibase.html	26/04/2017
Saliva Ejector	£0.04	https://www.dentalsky.com/medibase-saliva-ejectors-blue-100-medibase.html	26/04/2017
FILLINGS			
Consumables	Cost/item	Source	Date
Bur	£1.50	https://www.dentalsky.com/rs-steel-burs-round-4-iso-014-6-r-s.html	26/04/2017
Wedge	£0.12	https://www.dentalsky.com/hawe-wedges-assorted-100-kerr.html	26/04/2017
Matrix strip	£0.56	https://www.dentalsky.com/polydentia-matrix-strip-5mm-polydentia.html	26/04/2017
Matrix band	£0.16	https://www.dentalsky.com/eco-matrix-band-narrow-sigveland-12-perfection-plus.html	26/04/2017
Articulating paper	£0.05	https://www.dentalsky.com/bauscha-articulating-paper-blue-200-300-bausch.html	26/04/2017
Local anaesthesia cartridge	£0.48	https://www.medicinescomplete.com/mc/bnf/current/DMD21313511000001103.htm?q=Lignospan%20Special%202%25%20injection%202.2ml%20cartridges%20%28Kent%20Pharmaceuticals%20Ltd%29&t=search&ss=text&tot=1&p=1#DMD21313511000001103	26/04/2017
Amalgam capsule	£3.23	https://www.dentalsky.com/grandioso-set-caps-80x025g-voco.html	26/04/2017
Vaseline	£0.00	https://www.amazon.co.uk/Vaseline-Original-Petroleum-Jelly-250ml/dp/B0042280CM/ref=pd_sbs_121_1?encoding=UTF8&psc=1&refRID=06QSTDFZZMYCJC4289DE	26/04/2017
Bond	£0.60	https://www.dentalsky.com/optibond-solo-plus-refill-5ml-kerr.html	26/04/2017
White filling material (compules)	£2.43	https://www.dentalsky.com/esthetx-hd-compule-refill-20-a1-dentsply.html	26/04/2017
PREFORMED METAL CROWN			
Consumables	Cost/item	Source	Date
Spacers	£0.02	https://www.dentalsky.com/loose-radiopaque-separators-dentsply-gac.html	26/04/2017
Preformed crown	£5.67		04/08/2017

Gauze	£0.02	https://www.dentalsky.com/gauze-napkins-15x15cm-500-perfection-plus.html	26/04/2017
PULPOTOMY			
Consumables	Cost/item	Source	Date
Saline	£5.60	https://www.dentalsky.com/sterile-saline-water-pouches-hygitech.html	26/04/2017
Ferric Sulfate	£0.08	http://www.ebay.co.uk/itm/Dental-Astringedent-Hemostatic-15-5-Ferric-Sulfate-Ultradent-Hemostasis-30-ml-/330981429046	07/08/2017
Cotton wool wedget	£0.03	https://www.dentalsky.com/steriblue-cotton-pellets-size-1-1000-steriblue.html	26/04/2017
AUTOCLAVING			
Consumables	Cost/item	Source	Date
Washing detergent	£0.12	https://www.dentalsky.com/thermodent-alka-clean-5-litres-schulke.html	26/04/2017
Storage bags	£0.04	https://www.dentalsky.com/medibase-sterilisation-pouches-90x130mm-200-medibase.html	17/07/2017
Bags used in the autoclave	£0.38	https://www.fishersci.co.uk/shop/products/polypropylene-clear-autoclave-bags/p-8000601	17/07/2017
SALARIES			
Job Description	cost/min	Source	Date
GDP - NHS dentist (provider only)	£0.68	PSSRU - 2016: provider only dentist	17/07/2017
Dental Therapist	£0.28	Band 5 point 20 - used starting band midpoint	05/05/2017
Dental Hygienist	£0.28	Band 5 point 20	05/05/2017
Oral Health Educator	£0.28	Band 5 point 20	05/05/2017
Childsmile/Extended duty dental nurse	£0.23	Band 4 point 14	05/05/2017
Vocational Therapist	£0.23	**assume band 4** midpoint	05/05/2017
Dental nurse	£0.21	Band 4 point 1	06/05/2017
CT1	£0.35	Band 6 point 6/ Band 7 point 1	07/08/2017
Dental nurse trainee	£0.16	75% of Band 4 point 1	07/08/2017

RESOURCES FOR OPERATIVE TREATMENTS

Materials and instruments – used for fillings
Standard Kit (common to every filling material)
Conservation (Cons) kit (reusable)
Cotton wool rolls (single use)
high speed drill (reusable)
slow speed drill (reusable)
aspirator (reusable)
aspirator tip (single use)
2 x burs (single use)
If 2 or more surfaces involved
wedge (single use)
matrix band (single use)
matrix strip
If occlusal surface implicated
articulating paper (single use)
amalgam
Amalgam capsule (single use)
Dappen's dish (single use)
Amalgam carrier (reusable)
Amalgam Capsule Mixing Machine Tool Mixer (reusable)
glass ionomer
glass ionomer cement (single use product but multiple mixes from one bottle)
Composite
Bond (single use material but many X ml amounts from one bottle)
Dappen's dish (single use)
Microbrush (x2)
Composite gun (reusable)
Curing light (reusable)
white filling material (compules) (single use)
Compomer
same as composite
Resin modified GI
same as glass ionomer
curing light (assume included)

ASSUMED RESOURCES FOR EACH TREATMENT

Resources used at every visits
Gloves (GDP & nurse)
Masks (GDP, nurse, & child)
Bib (child)
Tissues
Disposable cup (water)
Tablet (water)
3 in 1 tip
Sheath
Mirror
Probe