Appendix 7

Studies forensisch licht bij kinderen met blauwe plekken						
Authors	Title	Year	Forensic light for visualisation of bruises in children?	Included?	PDF?	Conclusion
Experts						
Mackenzie B, Jenny C	The use of alternate light sources in the clinical evaluation of child abuse and sexual assault	2014	Yes	Yes	Yes	Review: no specific data on children.
Lombardi M, Canter J et al.	Is fluorescence under an alternate light source sufficient to accurately diagnose subclinical bruising?	2015	No - adults	No	Yes	Adults only.
Limmen RM, Ceelen M et al.	Enhancing the visibility of injuries with narrow-banded beams of light within the visible light spectrum	2013	Yes - 12-56 years old, not possible to extract data on children	Yes	Yes	Narrow-banded beams of ligth within the visible light spectrum enhance visualization of injuries, including contours, size and pattern. Especially violet and blue improve the visibility. Not possible to extract data on children.
Holbrook, D. S. & Jackson, M. C.	Use of an alternative light source to assess strangulation victims.	2013	No	No	Abstract only	Focus on strangulation and adults.
Review AMC VU						
Horisberger B, Krompecher T.	Forensic diaphanoscopy: how to investigate invisible subcutaneous hematomas on living	1997	No - 16-85 years old, partly cadavers, partly living subject. Not possible to extract data on children.	Yes	Yes	Horisberger and Krompecher tested diaphanoscopy on cadavers and living persons aged between 16 and 85 years old. They found a bruise detection sensitivity of 95% and a specificity of 97%. Not relevant for our guideline.

	subjects.					Not possible to extract data on children.
Garcia JE, Wilksch P a, Spring G, Philp P, Dyer A.	Characterization of Digital Cameras for Reflected Ultraviolet Photography; Implications for Qualitative and Quantitative Image Analysis During Forensic Examination.	2013	No - Photography	No	Yes	Presenting a methodology for obtaining high-quality monochrome digital images from reflected UV-A radiation through the characterization of two digital cameras sensitive to this region of the electromagnetic spectrum.
Vogeley E, Pierce MC, Bertocci G.	Experience with wood lamp illumination and digital photography in the documentation of bruises on human skin.	2002	Yes	Yes	Yes	Vogeley et al used such an external light source (Woodlamp) for UV-light illumination on four children. Normally not visible bruises, became visible.
Lawson Z, Nuttall D, Young S, Evans S, Maguire S, Dunstan F, et al.	Which is the preferred image modality for paediatricians when assessing photographs of bruises in children?	2011	No - Photography in one child	No	Yes	Infrared photography (IR photography) uses wavelengths above 700 nm. These wavelengths penetrate the skin up to 3mm, which could enhance reflectance spectroscopy measurements. This additional information could be valuable, especially in dark-skinned children.
Rowan P, Hill M, Gresham GA, Goodall E, Moore T.	The use of infrared aided photography in identification of sites of bruises after evidence of the bruise is absent to the naked eye.	2010	No - Infra Red imaging and no age stated	No	Yes	Despite the longer wavelengths of InfraRed, bruises are not detectable for a longer period.
Maguire and Mann						
Barsley RE, West MH, Fair JA.	Forensic photography: ultraviolet imaging of wounds on skin.	1990	No - UV photography	No	Yes	Ultraviolet photography may reveal bruises that are no longer visible to the naked eye, i.e. 2 to 10 month old injuries. This photography has been used in fatal and non-fatal cases, but longitudinal

						studies are lacking in a paediatric context.
Rowan P, Hill M, Gresham GA, Goodall E, Moore T.	The use of infrared aided photography in identification of sites of bruises after evidence of the bruise is absent to the naked eye.	2010	No - Infra Red imaging and no age stated	No	Yes	Infra-red imaging was assessed to determine if it could detect bruises no longer visible with the naked eye or on conventional imaging. It did not reveal any significant evidence of bruising that was not otherwise visible.
Bernstein M, Nichols G, Blair J.	The use of black and white infrared photography for recording blunt force injury.	2013	No - Infra Red imaging and no age stated	No	Yes	A study of post-mortem cases noted that InfraRed identified contusions that were not visible clinically although one false negative also occurred. The precise pattern was not evident by InfraRed.
Randeberg LL, Haugen OA, Haaverstad R, Svaasand LO.	A novel approach to age determination of traumatic injuries by reflectance spectroscopy.	2010	No - Reflectance spectrospocy and age rang 23-83 years	No	Yes	Reflectance spectroscopy may assist in ageing bruises but, to date, there is only experimental data available.
Stam B, van Gemert M, van Leeuwen T, Aalders M.	3D finite compartment modeling of formation and healing of bruises may identify methods for age determination of bruises.	2010	No - Model description	No	Yes	Reflectance spectroscopy may assist in ageing bruises but, to date, there is only experimental data available.
McMurdy JW, Duffy S, Crawford GP.	Monitoring bruise age using visible diffuse reflectance spectroscopy.	2007	No	No	Abstract only	Use of reflection spectra to determine age of bruising explored in adults and children – not yet used in clinical practice.
Kim O, McMurdy J, Lines C, Duffy S, Crawford G, Alber M.	Reflectance spectrometry of normal and bruised human skins: experiments and modeling.	2012	No	No	Abstract only	A stochastic photon transport model in multilayer skin tissue combined with reflectance spectroscopy measurements is used to study normal and bruised skins; this is proposed as a potential model for ageing bruises.
Duckworth MG, Caspall JJ, Mappus	Bruise chromophore concentrations over	2008	No	No	Abstract only	Adult studies evaluating chromophore concentrations as an aid to ageing bruises show a

RL, Kong L, Yi D, Sprigle SH.	time.					high amount of variance to date. Not yet suitable for clinical use.
Mimasaka S, Oshima T, Ohtani M.	Characterization of bruises using ultrasonography for potential application in diagnosis of child abuse.	2012	No - Ultrasound	No	Yes	Ultrasound was used to determine the depth and extent of a bruise.
Nuzzolese E, Di Vella, G.	The development of a colorimetric scale as a visual aid for the bruise age determination of bite marks and blunt trauma.	2012	No - Single case study	No	Yes	Single case study proposing a colorimetric scale for the evaluation of bruises / bites.